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Hurricanes Dennis and Floyd: Coastal Effects and Policy Implications

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ABSTRACT

Tropical systems Dennis and Floyd impacted eastern North Carolina in 1999, the fourth and fifth storms in three years to make landfall in this area. All five storms were very similar in strength (wind speed); however, the effects on the coast were quite different. In addition to absolute storm strength, morphological changes to the natural environment were controlled by the forward speed of the storms, orientation of the shoreline relative to storm track, underlying geology, impacts of recent storms, and associated rainfall. Damage to buildings was a function of the placement of structures with respect to the shoreline and the removal of weaker buildings by previous storms. On the basis of these observations, we recommend a new Hurricane Impact Scale, which will allow prediction of possible storm impacts and comparisons of coastal impacts in other hurricanes.

Each additional hurricane demonstrates that our society does not have a forward-looking plan for dealing with coastal storms. Instead, we typically repair and rebuild in place, and continue the upward spiral of property damage in storms. Although the dollar amount of property damage will be low from these storms, the public must bear the cost of cleanup and repair of infrastructure.



Figure 1. Erosion on Oak Island, North Carolina by Hurricane Floyd in 1999. Pilings on the house and exposed, broken septic tanks lining the beach indicate that the beach profile was lowered approximately 1 m during the storm. Septic tanks are emplaced with drain fields above the water table, which limits their location in nearshore environments. As an example of the range of impacts of human development in the coastal zone, before Floyd the recreational beach was situated directly above these septic systems.

INTRODUCTION

The probability that a hurricane will make landfall at any given point along the coast in any one year is low, and the even lower probability of a great hurricane (category 3, 4, or 5) makes such an event seem extremely unlikely. But low probabilities give a false sense of security, because the lesson of hurricane history tells us that in the lifetime of a building such a storm is almost a certainty. Furthermore, the occurrence of a hurricane one year does not reduce the likelihood that a similar storm will strike again the next year.

The coast of North Carolina was struck by two hurricanes in 1996 (Bertha and Fran). It happened again in 1999. Hurricane Dennis impacted the coast for several days, from August 30 to September 4. Hurricane Floyd made landfall on September 16, causing record flooding across most of eastern North Carolina and damage to shoreline structures in some places (Fig 1). These were the fourth and fifth storms to strike the North Carolina coast in the past three years (Fig. 2). Local

meteorologists and the popular media described the first of these (Bertha) as a 50-year storm—a storm that would be expected to recur once every 50 years. All five storms in this three-year period were of comparable strength and had varying coastal impact. Obviously, our concept of a 50-year storm may need some adjustment. It is also clear that despite recent improvements in hurricane forecast models, long-term forecasting is still difficult if not impossible, as demonstrated by both 1999 storms. We describe here the geological impact of these two storms in North Carolina, and we discuss our views on the coastal zone management lessons to be learned and the need for a new scale to communicate predicted and observed coastal storm impacts.

HURRICANE DENNIS

Dennis tracked up the U.S. East Coast as a category 3 hurricane on the Saffir-Simpson scale of hurricane intensity, stalling off the Outer Banks of North

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Carolina on Monday, August 30. The storm then reversed course, remaining off North Carolina until it made landfall across Core Banks on Saturday, September 4 (Fig. 2). By that time Dennis had weakened to a tropical storm (sustained winds less than 119 km/h).

Hurricanes usually move ashore quickly, minimizing the time available to erode beaches, but Dennis stayed offshore for several days, producing large waves much like a stalled winter storm or nor'easter. In this century, the storm that caused the most damage on the Outer Banks was the Ash Wednesday storm of 1962, a nor'easter that remained stationary for three days at the time of spring tides. Tidal amplitude on the Outer Banks is small (less than 1 m) but large enough to cause increased dune erosion and inland penetration by overwash when storms arrive at high tide. Waves from Dennis impacted the shoreline of the North Carolina Outer Banks through at least a dozen high tides, a major factor in island response to the storm. Even though damage to structures along the shoreline was not extensive, the long duration of Dennis may have caused as much coastal erosion and shoreline retreat as a category 4 or higher hurricane.

On narrow and undeveloped Core Banks (Fig. 2), part of the Cape Lookout National Seashore, large numbers of narrow overwash fans were produced as storm surge flooded parts of the island and storm waves rolled ashore and across the island through dune gaps and eroded dunes. In this way, sand was actively deposited on the island (Fig. 3). A few of the overwash fans extended into the sound behind the

island. Barrier island migration is a complex process primarily driven incrementally by storms during times of rising sea level (Leatherman et al., 1982; Nummedal, 1983; Leatherman, 1983a, 1983b). Pilkey et al. (1998, p. 44–47) described barrier island migration with North Carolina examples as a three-step process. Barrier islands migrate landward by: (1) shoreline retreat on the open ocean side, (2) elevation of the island by the addition of overwash sand, and (3) movement of the island's soundside shoreline landward by extension of the overwash fans into the sound. All of these processes were evident on Core Banks following Hurricane Dennis. In this fashion, Core Banks took another small step landward and up the coastal plain during the current sea-level rise.

Along Hatteras Island (Fig. 2), within the Cape Hatteras National Seashore, several small communities are connected by a lone road, the two-lane, blacktop NC Hwy 12. Overwash sand covered the road in many places and was quickly cleared by highway crews following the storm; most of it was moved to the nearby beach. A <0.5 km section of the road north of Buxton that was entirely destroyed during the hurricane was rebuilt within three days. We are trying to convince the North Carolina Department of Transportation to leave the overwash sand in place and rebuild the road, perhaps with gravel. This would allow the island in the National Seashore to function naturally, and the road elevated by the addition of overwash would be subjected to less frequent storm flooding, reducing damage in future storms and saving taxpayer dollars.

In the 1930s, as part of a Civilian Conservation Corps project during the

The Year Past and the Year Ahead

We are completing an exciting year at GSA and looking forward to a new year, a new century, and a new millennium. Here, I review what GSA has accomplished and tell you about some of my goals for the next 12 months and the next several years.

In July, the headquarters staff completed a significant reorganization, to align our human and fiscal resources with the annual goals that were defined from the five-year strategic plan. In the next several issues of *GSA Today*, we will discuss the strategic plan with you in greater detail and highlight progress and new directions. The four new functional areas at GSA headquarters are Science, Education, and Outreach—focused on education and public policy; GSA Enterprises—our revenue-generating activities; Member Services—the interface and service center for members; and Infrastructure Services and Support—for all our in-house needs in Boulder.

With the reorganization of our Science, Education, and Outreach group, we envision a new direction in education. We are expanding our focus to include K–12, undergraduate, and graduate levels. A new Education Science Officer position has been approved, and a national search committee is being formed. Robert Ridky, University of Maryland, will chair this committee.

All programs and services that directly support members are located within Member Services. A new Member Service Center will provide real-time service for all our members and our customers. On January 3, 2000, you can reach this team at our new toll-free number, 1-888-443-4472, to buy a book, change your address, register for a section or annual meeting or get a question answered. To gather more information about members, we initiated a comprehensive general membership survey in November 1999. A sample set of 3,300 was selected from our total membership of 16,000.

At this year's annual meeting we received 85% of the 2,942 abstracts electronically; this is the highest electronic submission rate and the largest number of abstracts ever for GSA. We had 6,389 registrants at our meeting in Denver, making it one of the three largest GSA annual meetings. Planning is now underway for the first GSA global meeting, scheduled for June of 2001. This joint venture with the Geological Society in London will be held in Edinburgh, Scotland. Meetings are one part of GSA Enterprises; publications are the other part. In 2000, a feasibility study on electronic publishing options will begin.

To tend, unflinchingly, unflinchingly, towards a goal is the secret of success.

—Anna Pavlova

A new budgeting process was reviewed with the Investment and Budget committees at the 1999 GSA Annual Meeting and will be used in the preparation of our fiscal year 2000 budget. This new model balances growth of our investment portfolio with prudent spending. Growth of the portfolio will be ensured first, to protect the long-term future of GSA. To provide program review and prioritization, a new committee, the Programmatic Overview Committee (POC), was formed. At the committee's first meeting, the GSA staff reviewed the 166 current programs. This review allowed our leadership to look at GSA as a whole, not just piece by piece. The overall success of the first program review led to the POC becoming a standing committee, which will meet annually at the spring Council meeting.

To accomplish the array of objectives in our strategic plan, GSA must pursue strategic partnerships. These joint ventures will enlarge GSA's sphere of influence and help us to reach our goals in more timely and cost-effective ways. Currently, we are investigating joint ventures for global meetings, online publications and digital archive creation, integrative science, and student programs. Strategic alliances have been formed with the USGS, National Park Service, National Forest Service, AGI, and the Geological Society (London). All 23 of our associated societies are reviewing new partnership opportunities for 2000 and beyond.

In the next year, I look forward to shifting my perspective from internal operations to external partnerships. Adopting a more external view will allow me to work on strengthening our existing partnerships and exploring new ones—aiding in the expansion of GSA's sphere of influence. I am excited about the future and very pleased with the progress to date. To get a chance to chat with you in 2000, I will attend all the section meetings in the spring. Roundtable discussions will be scheduled to discuss GSA and gather your insights and hopes for the future, and to learn how GSA can help you attain your goals.

Enjoy the New Year!

Hurricanes *continued from p. 2*

depression, a large frontal dune line for erosion control was constructed from the North Carolina–Virginia line to the western end of Ocracoke Island (Stick, 1958, p. 250). The presence of the dune encouraged beachfront development in areas previously routinely overwashed during storms. Now the artificial dune line has large gaps due to shoreline retreat, and hundreds of buildings are exposed to storm processes, especially north of Oregon Inlet in the old towns of Nags Head, Kitty Hawk, and Kill Devil Hills (Fig. 2). In these communities, Dennis covered the roads with sand and debris and eroded beneath numerous houses elevated on pilings. These communities are particularly

prone to flooding because the interior of the island is at a lower elevation than the oceanfront and because the primary dunes, which would have afforded some measure of protection from storm surge and waves, have been eroded. The seaward-facing part of the island communities is a landward-sloping surface of coalesced overwash deposits. Storm surge and waves easily overtop the overwash and flood the island interior. Thus, for the fifth time since 1990, the seaward-most, three-block area of the towns was flooded by ocean water trapped behind the higher elevation beachfront. Because the old dune cannot be replaced without removal of the first row of houses, a politically difficult thing to do, these communities face more flooding from future storms.

An aerial flyover of the impacted area after the storm indicated that the amount of dune and beach erosion varied considerably along various shoreline reaches. We believe that the differences in shoreline impact may have been strongly controlled by offshore geology; in particular, Kinna-keet and Wimble shoals partially protected the towns of Avon and Salvo, respectively. Geologic framework and barrier island dynamics are discussed by Riggs et al. (1995). Overall, only a small number of buildings were destroyed by Dennis, because the winds were sub-hurricane strength and storm surge was probably only about 0.5–1 m. Sand was eroded from beneath many buildings, and some, partic-

Hurricanes *continued on p. 4*



At Dinosaur Ridge near Morrison, Colorado.

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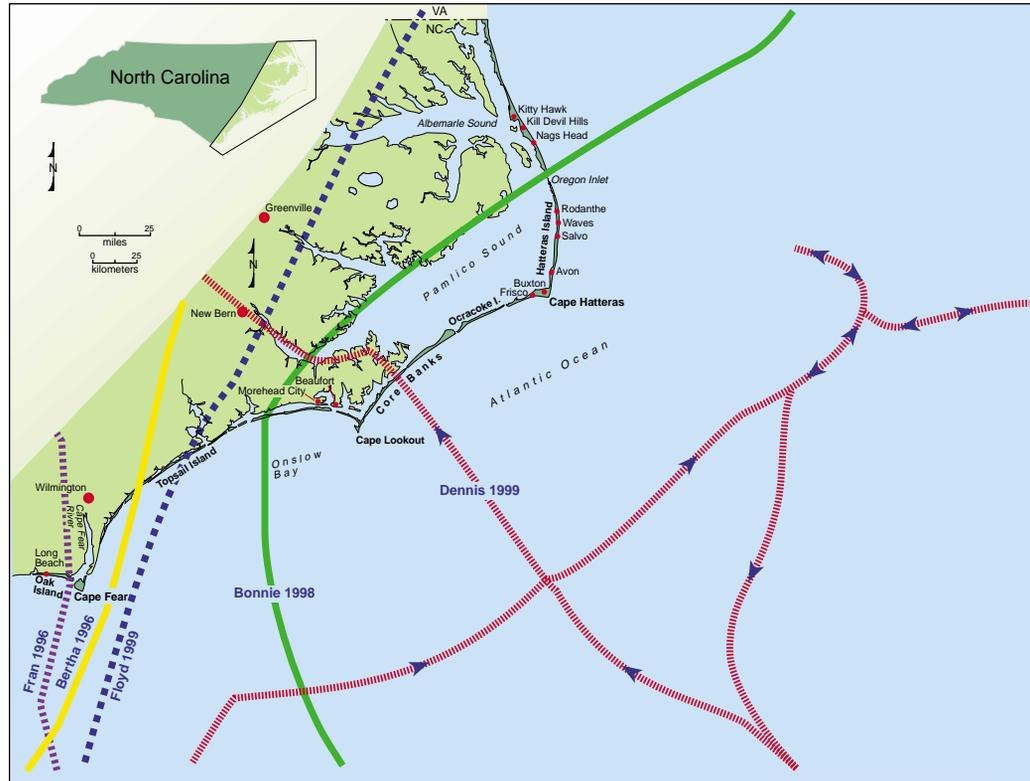


Figure 2. Eastern North Carolina and tracks of the five hurricanes affecting the North Carolina coast from 1996 to 1999. Notice the similarity in landfall locations, especially of Fran, Bertha, and Floyd, and the erratic path of Dennis. The Outer Banks of North Carolina stretch over 280 km from the Virginia line to below Cape Lookout.

Hurricanes *continued from p. 3*

ularly in Rodanthe, were left stranded seaward of the high-tide line.

Immediately after the storm, North Carolina Governor Jim Hunt declared that federal funds for a beach nourishment project, long in the planning stage, were needed immediately. The project as planned is a small one, however, and probably would not have prevented flooding and other damage. The speaker of the North Carolina State Senate, in whose district most of the hurricane damage occurred, stated that the shoreline was in the “worst erosive shape possible” prior to the storm, and that beach and road-building money was needed immediately. His view is undoubtedly shaped by the fact that more buildings than ever were exposed to the storm, the inevitable consequence of decades of shoreline retreat occurring simultaneously with intensive beachfront construction of cottages and motels. The Outer Banks are perhaps the most naturally dynamic developed barrier island chain in North America, but as is true everywhere, politicians respond with crisis-driven maintenance of the status quo, thereby treating beachfront development in similar fashion to inland development at higher elevations. Our view is that due to a lack of planning for sensible post-storm action, an opportunity is missed to relocate buildings and roads back to safer locations following storms such as Dennis. The Outer Banks are a high-hazard setting for development. There is high wave

energy here due to a narrow continental shelf (Hayes and Sexton, 1989). In addition, high storm frequency and ongoing sea-level rise will mean that maintenance of the shorefront in its current location will prove ultimately impossible.

One building, the six-story Comfort Inn at Whalebone Junction in Nags Head (Fig. 2), now resides on the beach, having lost its swimming pool. This is an old structure, probably the first high rise built on the Outer Banks. The hotel was originally built well back from the beach. Shoreline retreat of about 1 m/yr has caught up with the hotel. Because seawall construction is illegal in North Carolina, a politically difficult situation faces the state’s coastal managers. We believe that this building represents a landmark in the state’s efforts to preserve beaches for future generations. If a variance in the regulation is granted, North Carolina’s anti-shoreline armoring regulation is doomed, as is the future quality of recreational beaches.

HURRICANE FLOYD

Hurricane Floyd was a much larger and more powerful storm than Hurricane Dennis, although it was not as strong and was smaller than Hurricane Hugo, which struck the South Carolina Coast in 1989. After causing serious wind damage in the northern Bahamas, the storm threatened the east coast of Florida with maximum sustained winds of 249 km/h (category 5 is >249 km/h). As it tracked to the north, it gradually lost wind velocity, coming ashore in southern North Carolina, south

of Cape Lookout as a strong category 2 storm with maximum winds around 150 km/h. The hurricane dumped more than 50 cm of rain on parts of eastern North Carolina where the ground was already saturated from the passing of Hurricane Dennis. Floyd followed a classic path, curving up the U.S. East Coast, leading to the largest evacuation in U.S. history, more than 2 million people in Florida, Georgia, South Carolina, and North Carolina. Track forecast models fared much better than in Dennis, but model uncertainty allowed for possible landfall in Florida, Georgia, and South Carolina before the storm went ashore near Cape Fear, North Carolina (Fig. 2).

The beachfront damage, the primary focus of this paper, has received relatively little attention in the North Carolina and national media because the most damaging aspect of Floyd was riverine flooding in eastern North Carolina and New Jersey. Flood levels in several North Carolina counties exceeded the 100-year recurrence interval level and were the highest ever recorded. Two interstate highways (I-40 and I-95) were blocked for several days and two universities (University of North Carolina at Wilmington and East Carolina University in Greenville) were closed because of power loss, emptying students from dorms into communities cut off in all directions by river waters. This type of storm presented major difficulties for those who evacuated from the Outer Banks, which turned out to be largely unaffected by Floyd. One person left Ocracoke Island (Fig. 2) only to require rescue off an inland roof top by helicopter.

On the coastline, Long Beach, North Carolina, on Oak Island (Fig. 2), was hit the hardest. This old community has a history of disruption by hurricanes. It was thriving prior to 1954, when 300 out of 305 buildings, properly built well back from the beach, were destroyed or moved off their foundations by category 4 Hurricane Hazel. The buildings were rebuilt, and the shoreline, in its inexorable, 0.5–1 m/yr landward creep, caught up with the buildings. During Hurricane Floyd, about 240 beachfront homes (more than half of the oceanfront homes in the community) were destroyed or made uninhabitable, largely due to wave action on top of a 1.5–2.5 m storm surge. Before the storm, it was clear that the extensive damage was entirely predictable, because this was a highly vulnerable community (Pilkey et al., 1998). A large vertical scarp was formed in many places at the back of the beach on Long Beach. The scarp cuts into old wetland sediments imbedded with tree stumps—another clue that this barrier island was sand-poor and vulnerable before the storm. Previous work has shown that the age of tree stumps exposed on the beach varies along Oak Island,

ranging from about 3.8 to 1.8 ka (Griffin et al., 1979; unpublished data of Cleary). This is further evidence of the island's erosive history even before the storm.

On heavily developed, low-elevation, narrow Topsail Island (Fig. 2), most of which was extensively damaged by Hurricanes Bertha and Fran (occurring within eight weeks of each other in 1996) building damage was much less than on Long Beach. Local officials attributed this to the fact that the poorly constructed buildings had been removed by the earlier storms. In addition, the storm surge from Floyd was 0.3–0.8 m less than during Fran. Instead of a dune scarp, the northern part of the island had the appearance of a large smooth sandbar, because almost the entire island was covered by a sheet of overwash

sand. The island infrastructure, roads, power and phone lines, and septic and sewer systems were largely destroyed after having been replaced by federal funding after Fran in 1996. In spite of the lack of loss of private property, the federal recovery costs to replace infrastructure on this island will be large. At least two and possibly three of the temporary inlets opened by Fran were reopened in Floyd. Some houses built after Fran in the throats of the former inlets were washed under but survived. Strong evidence was noted of erosion caused by channelization of storm-surge ebb (the seaward return of the storm surge as the storm moved away; Fig. 4). Along much of Topsail Island, the only frontal dune was an artificial one, constructed largely from sand bulldozed from

the beach. Much of the dune disappeared in Floyd (Fig. 5), making up a large part of the overwashed sand on the island. At the northern end of the island, the dune has been replaced at least five times in the 1990s.

NEED FOR A NEW HURRICANE IMPACT SCALE

After Dennis and Floyd, as well as several previous hurricanes that have affected North Carolina over the past several years, it is clear that coastal geologists must do a

better job of conveying to the public the coastal geomorphological effects of these storms. The public hears about the Saffir-Simpson hurricane scale and has a good idea of the relative strength of storms. Saffir-Simpson is a scale of categories 1 (120–152 km/h) to 5 (>249 km/h), and was originally developed as a hurricane damage potential scale (Simpson, 1974). Although the scale is satisfactory for describing the absolute strength of a hurricane in the open ocean, it is less satisfactory in describing the effect of a hurricane on the shore during landfall. Geologists understand that the actual impacts of any given hurricane on the coast will vary depending on several geologic and meteorologic factors including, but not limited to: (1) the absolute strength of the hurricane (wind speed), (2) the size of the storm (radius of maximum winds), (3) forward speed of the storm center (faster equals higher storm surge), (4) track of the storm relative to orientation of the shoreline (perpendicular approach means higher storm surge, low-angle approach means greater area affected), (5) storm duration (relatively short in most hurricanes), (6) offshore and onshore profiles (major control on storm surge), (7) plan-view shape of the shoreline (major control on storm surge), (8) underlying island geology including sand supply (can control shoreline erosion and overwash, see Riggs et al., 1995; Cleary, 1997), and (9) recent storm history (one storm removing the protective dunes, setting up the shoreline for greater damage to structures in a subsequent storm). Because the Saffir-Simpson scale does not consider these local and regional controls on coastal response to hurricanes, we believe that a new scale emphasizing hurricane impact is needed.

Hurricanes *continued on p. 6*



Figure 3. Core Banks, North Carolina, was almost completely overwashed by Hurricane Dennis as the storm stalled offshore for several days. With each high tide, storm-surge flooding and storm waves washed sand onto and, in some cases, completely over the island. Storms drive barrier island migration during rising sea level. Overwash deposits are a primary way in which island elevation is built up and the soundside shoreline is incrementally moved landward.



Figure 4. When storm surge water flows back to sea, either by the force of gravity alone or when driven by offshore-blowing winds, an erosive ebb current may be generated with a potential for intense scouring of unconsolidated material. Often, structures in the path of such scouring are undermined and may topple. In this example from Topsail Island, storm-surge ebb scouring has eroded a channel at least three feet deep. The house in the center of the photo survived because the scour channel divided and flowed on either side of it.



Figure 5. Immediately after Hurricane Fran in 1996, an artificial dune was built along the shoreline of North Topsail Beach (the northeastern one-third of Topsail Island) for protection of the only access road. The dune was almost entirely removed by Hurricane Floyd in 1999, and the sand was redistributed as washover deposits on the island.

Hurricanes *continued from p. 5*

We are developing a Hurricane Impact Scale (HIS) that could be used pre-storm to warn residents of coastal communities of potential coastal impacts and post-storm to compare events. The criteria to be considered for the new HIS are: (1) maximum elevation of the storm surge (the elevated water level associated with the passage of a hurricane), (2) storm surge spread (how large an area has been impacted by higher water level), and (3) wind speed.

The HIS will reflect the understanding that all storms of the same Saffir-Simpson category do not have the same coastal effects. Even identical storms striking the same shoreline reach may have differing impacts. For example, storm surge from Hurricane Floyd was predicted and reported to be 4.6 m on Long Beach but was in actuality between 1.5 and 2.5 m. The 4.6 m estimate was based on the Saffir-Simpson scale for a standard category 4 hurricane approaching perpendicular to the shore across a continental shelf of known width and shape. Hurricane Floyd, however, came ashore at Cape Fear, at which point the most deadly northeast quadrant was out at sea and the continental shelf region used to generate storm surge was different than that of the predictive model. Because of the uncertainty inherent in hurricane track forecast models, it is impossible to predict exactly where a hurricane will make landfall, and thus it is impossible to predict exactly what the coastal impacts will be. The Hurricane Impact Scale will provide a larger range of categories than the Saffir-Simpson scale, and we envision using the two scales in conjunction. Taking the meteorological characteristics of the storm and using the criteria above, we will predict, for example, that a given storm will have an HIS category of 9 if it stayed on one track but 13 if it veered to another track. Thus, we will predict a range of HIS categories for a single storm, depending on the forecast range of landfall tracks. Post-

storm investigations will provide a single HIS for a given storm, and allow easy comparisons to other storms.

CONCLUSIONS

Tropical systems Dennis and Floyd will not go down in history as significant coastal events. Dennis will be remembered for its erratic path, and Floyd will be remembered for its record-setting and devastating inland flooding. More significant is the opportunity to compare effects of these two and three other storms (Bertha and Fran, 1996; Bonnie, 1998) of similar strengths impacting essentially the same area in just three years.

Hurricanes and other coastal storms play an integral role in barrier island migration during times of rising sea level. In the larger sense, hurricane-driven oceanside erosion and deposition of overwash sand on barrier islands and completely over them are important steps in the barrier island migration process and were well illustrated by these storms. However, the smaller-scale ocean-shoreline morphological changes, and especially the interaction between storm processes and human development, varied greatly in each of the five storms. This complex interaction is dependent on many geomorphic and geologic factors in addition to the meteorological factors of storm strength, size, and forward speed. Ongoing studies are assessing which factors are the more important.

There are two important coastal policy lessons to be learned from these recent storms. First, we do not have a forward-looking plan for dealing with coastal storms. The typical response is cleanup and complete rebuilding, maintaining the status quo. Coastal planning must incorporate storms as part of the plans. We must learn from nature and not rebuild damaged structures and infrastructure in place, nor with the same design. Little planning effort goes into learning how to best rebuild after a storm. Witness the artificial dune line on northern Topsail Island or NC Hwy 12 near Buxton which are damaged and rebuilt over and over again. The second policy lesson is that even though none of these storms had a high dollar amount of property damage at the shoreline, and will thus be considered largely as non-events, the public still must pay to repair infrastructure. Even if not a single house was lost on Topsail Island, for example, the cost to remove all the sand from the roads, rebuild the roads, repair the electrical supply system, and rebuild the frontal dune will be great. Insured costs to homeowners is the damage amount typically reported, but the cost of repairing infrastructure is not an insured cost, and it is borne by the public.

The legacy of Bertha, Fran, Bonnie, Dennis, and Floyd may well be that they

allowed detailed comparisons over a relatively short time frame in a relatively compact geographic area. The need for a new Hurricane Impact Scale grew out of these comparisons. A better understanding and ability to predict storm-process interaction with development, and a greater ability to communicate these predictions to the public, will aid in coastal management decisions on zoning and land-use planning. As coastal population continues to swell, coastal geologists must take a more active role in coastal management. Immediate post-storm observations such as those presented here will remain an important tool.

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GeoRef

Bruce F. Molnia, bmolnia@erols.com

Washington Report provides the GSA membership with a window on the activities of the federal agencies, Congress and the legislative process, and international interactions that could impact the geoscience community. These reports present summaries of agency and interagency programs, track legislation, and present insights into Washington, D.C., geopolitics as they pertain to the geosciences.

Trouble at State

From specific incidences of emerging infectious diseases to the broad concerns about global industrial competitiveness, we know that science, technology, and health considerations permeate a vast array of issues that the Department of State grapples with every day. Yet ironically, as the world becomes more technologically interdependent, the trend at the State Department has been to downplay science and technical expertise. It's time to reverse that trend.

—Robert Frosch, chair of the National Research Council Committee evaluating science issues at the Department of State

A 1999 forum, Trouble at State, organized by the American Association for the Advancement of Science (AAAS), was a roast—actually a dissection—from several perspectives, of the way science, technology, and health issues are handled by the Department of State (DOS). Speaker after speaker reported on his or her unhappiness with the way such issues have been mishandled or ignored by the DOS. Keri Ann Jones of the Office of Science and Technology Policy (OSTP), Mary Good, former chairperson of the National Science Board and president-elect of the AAAS, Roland Schmidt, former chairperson of the National Science Board and former president of Rensselaer Polytechnic Institute, William T. Golden, a science advisor to President Truman and one of the founders of OSTP, and even Congressman Vern Ehlers (Republican—Michigan) all presented different variations of the same theme: there is significant trouble at State. The range of views included: science should permeate the State Department; the DOS is rushing from the 20th century into the 19th; U.S. industry needs the DOS to understand technical issues before making diplomatic decisions; DOS negotiators are very weak on technical issues; the DOS culture focuses on generalists—science and technology hold no weight and are perceived as being trivial; there is a need to spread science savvy throughout the State Department.

In response to widespread perceptions such as these, Secretary of State Madeleine Albright asked the National Research Council (NRC) of the National Academy of Science to form a committee to evaluate science, technology, and health issues at the DOS. The committee's report, *The Pervasive Role of Science, Technology, and Health in Foreign Policy: Imperatives for the Department of State*, recently released, recommends that Secretary Albright take decisive action to ensure that these issues are continuously integrated into the nation's foreign policy agenda. At a mini-

mum, the committee said, all foreign service officers and other diplomatic officials should have basic competence in science, technology, and health matters. Recruitment, training, and promotion should recognize the importance of these skills. In addition, assignments in these areas should be considered an important asset for all officials on career tracks to ambassadorships. The study was sponsored by the Golden Family Foundation and the Carnegie Corporation of New York

The report also urges Secretary Albright to appoint a highly qualified senior adviser on science, technology, and health. It also calls on the DOS to assign at least 25 technically trained science counselors with foreign policy expertise to serve at a comparable number of embassies in countries where these issues are most critical to the United States. The report also advises the DOS to establish promotion and career incentives for service in positions related to these areas. At present, with occasional exceptions, the report says, the most highly talented foreign service officers are ill-equipped for and have little incentive to seek those jobs. In fact, assignments related to science, technology, and health may be a career handicap, rather than an asset, for foreign service officers who are encouraged to develop other essential skills and who serve in political and economic positions. The report suggests that the DOS reward—not penalize—foreign service officers for their science, technology, and health experience and competence. The report builds on interim recommendations that the NRC committee made to the DOS in autumn 1998. In this final report, the committee notes that as yet there has been relatively little action on its earlier set of recommendations.

The NRC Committee noted that there was widespread concern among U.S. scientists and foreign policy experts that although developments in science, technology, and

health increasingly impact foreign policy, the DOS has reduced its capabilities in critical technical areas, including the elimination of science from the list of career tracks or “cones.” As environmental concerns have grown in importance, for example, the DOS has redirected resources to environmental diplomacy from other important areas that now receive little attention. Moreover, the number of science counselors at U.S. embassies has dropped precipitously, and most of the positions are filled by foreign service officers who have little relevant background. Thus, the embassy reporting mechanism by which the U.S. government keeps abreast of important emerging issues around the globe has seriously eroded. The report points to difficult diplomatic situations where science, technology, and health expertise has been essential—from nuclear non-proliferation to population growth, from the safety of the world's food supply to the future of the world's energy resources.

The committee presented 13 recommendations that the DOS could follow to integrate science, technology, and health awareness into the U.S. foreign policy agenda. Along with urging Secretary Albright to appoint a senior adviser and to assign science counselors to embassies worldwide, recommendations include:

- explicitly delegating to an undersecretary the responsibility for ensuring consideration of science, technology, and health factors in policy formulation, particularly during meetings and consultations involving the secretary or the secretary's senior advisers. The title of the undersecretary should include the phrase “for scientific affairs,” reflecting the new authority and responsibilities;
- establishing a science and technology advisory committee to provide expertise to the secretary and other officials on emerging and complex issues;
- transferring responsibility for international science, technology, and health activities to other federal agencies when appropriate. The DOS is overloaded with its ever-expanding portfolio of responsibilities; greater oversight for international programs should be dispersed to agencies capable of handling them;
- allocating sufficient resources to support the recommendations in the report. Important initial steps can be undertaken within the current organizational structure and personnel constraints, and with modest resource allocations.

The following are examples of regional and national issues with significant science, technology, and health content and foreign policy relevance identified by the committee: European Union—genetically modified agricultural products; regulation of toxic chemicals; foreign access to research funds; export controls on computers; harmonization of laws on intellectual property rights; reconstruction of infrastructure in the Balkans; and cooperation in science, technology, and health with nations of the former USSR.

Middle East (Jordan, Syria, Lebanon, Israel, Egypt, West Bank, and Gaza Strip)—use of water resources: efficiency, desalination, recycling; biodiversity: flora and fauna; malnutrition: micronutrients, celiac disease; communicable diseases: hepatitis; terrorism: transportation security, forensic investigations; population growth; and waste disposal: water and sewage treatment and burial of hazardous wastes.

Russia—exports of missile and nuclear technologies; brain drain of former weapon designers and computer scientists; emergence of small innovative private firms; infectious diseases: AIDS, hepatitis, tuberculosis; participation in international space station; protection of nuclear materials and safety of nuclear reactors; and Y2K computer retrofits: military, aviation, and financial systems.

China—energy mix and energy systems: coal, nuclear, hydropower; small stand-alone electrical grids; exports of military and dual-use technologies; population growth; development of space program; brain drain of students studying in United States; respect for intellectual property rights; and adequate and safe food supply.

Nigeria—oil exploration and exploitation; detection of drug trafficking; diseases: AIDS, river blindness, malaria; water and sewage treatment; population growth; nutrition deficiencies; and brain drain of well-educated specialists.

Mexico—breeding of wheat and corn varieties; sharing with United States of water resources; cultivation and trafficking of cocaine, marijuana, and synthetic drugs; compliance with pollution-reduction requirements of the North American Free Trade Agreement; food safety and contamination of food exports; sewage discharges along the Pacific coast; and labor standards in high-tech industries.

India—computer software capabilities, potential for nuclear weapons testing; population growth; biotechnology for agriculture and pharmaceuticals; adequate and safe food supply; trade with Russia in dual-use technologies; and a \$10 million program of U.S.-Indian science and technology cooperation. Japan—foreign access to research facilities; emergence of high-tech terrorist groups; earthquake engineering; development of dual-use aerospace technologies; expansion of nuclear power industry, including use of plutonium; fishing activities: southern, northeastern, and northwestern Pacific Ocean; and industrial competitiveness.

Copies of *The Pervasive Role of Science, Technology, and Health in Foreign Policy: Imperatives for the Department of State* are available from the National Academy Press, (202) 334-3313 or 1-800-624-6242. The report is also available on the World Wide Web at www.nap.edu/books/0309067855/html. ■

Farewell

In the summer of 1989, when I agreed to be the view-from-Washington columnist and Forum editor for a new GSA publication, I had no inkling that I would spend the next nine-plus years of my life deeply involved in *GSA Today*. However, after three terms, during which I wrote more than 250,000 words—80 Washington Reports and parts of 30 Forums—it's time to say goodbye.

Thank you, GSA members, for your feedback. Most of the comments I received from you indicated that the information I presented was generally well received. For the few who felt that it was not the role of the preeminent earth science society in the nation to present "political opinion," thank you as well, for your stimulating and often biting comments.

Without the help of GSA editorial and production staff, who not only polished my copy, but occasionally bent deadlines so that my articles could be as timely and current as a monthly newspaper could permit, I would have been gone long ago. During *GSA Today's* first nine years, we succeeded in publishing a Washington Report or a Forum or a Washington Report and a Forum in 11 issues every year. A sincere thank you to you, too, and a fond goodbye!

—Bruce F. Molnia



American Geological Institute CONGRESSIONAL SCIENCE FELLOWSHIP 2000-2001

The American Geological Institute is offering a Congressional Science Fellowship for the geosciences. The successful candidate will spend 12-16 months (starting September 2000) in Washington working as a staff member for a member of Congress or congressional committee. The fellowship is a unique opportunity to gain first-hand experience with the legislative process and make practical contributions to the effective and timely use of geoscientific knowledge on issues relating to the environment, resources, natural hazards, and science policy.

Prospective applicants should have a broad geoscience background and excellent written and oral communications skills. Minimum requirements are a master's degree with at least three years of post-degree work experience or a Ph.D. at the time of appointment. Although prior experience in public policy is not necessary, a demonstrable interest in applying science to the solution of public problems is desirable. The fellowship carries an annual stipend up to \$42,000. Funding for the fellowship is provided through the AGI Foundation.

Interested candidates should submit a cover letter and a curriculum vitae with three letters of reference to AGI Congressional Science Fellowship, 4220 King Street, Alexandria VA 22302-1502. For further details, visit the AGI web site <www.agiweb.org>, call 703-379-2480, or e-mail <govt@agiweb.org>. EOE

All application materials must be postmarked by February 1, 2000.

AGI is a federation of 34 scientific and professional societies in the geosciences.

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Proposal Deadline: January 10, 2000

Submit Session Proposals for the 2000 GSA Annual Meeting

You are invited to participate in the 2000 GSA Annual Meeting, in Reno, Nevada—*Summit 2000!* We encourage you to submit proposals for topical sessions and Pardee Keynote Symposia that will make this meeting *the* meeting of the year for earth scientists. Proposals are due by January 10, 2000, and must be submitted electronically. As GSA enters the next millennium, we anticipate an increasingly vital, dynamic, and high-quality annual meeting program.

GSA in Reno, *Summit 2000!*

Bob Karlin, Technical Program Chair

Reno, Nevada, is proud to be the site of the Geological Society of America's Annual Meeting, Summit 2000, next November. Reno lies near the boundary between the Sierra Nevada Range and the Great Basin, affording many opportunities to view diverse geologic phenomena. Well-exposed examples of ancient and modern tectonic systems, ranging from plate boundaries to continental interiors, are within close proximity of the meeting site. The Reno-Tahoe area is also an entertainment and recreational mecca, with a wide assortment of casinos, museums, and theatres; and a dazzling array of fine restaurants and pubs. World-class alpine and nordic skiing are less an hour away. Scenic attractions such as Lake Tahoe and historic locales such as the Comstock-era mining town of Virginia City are within a 45-minute drive.

Summit 2000, our theme, acknowledges this meeting as the largest and most important gathering of earth scientists in North America; in time, near the beginning of the third millennium; and in space, near the summit of the western ranges of the continent. One hundred years ago, no one could have envisioned what we now know about our planet, the technological advances we have made in imaging Earth and planetary systems, or the impact of humans on Earth. Although it is even more difficult now to imagine the advances and challenges in the next century, it is important to look forward, but also to reflect on the past.

The goals of Summit 2000 are to:

- Emphasize the multidisciplinary nature of the chemical, physical, and biological subdisciplines of the earth sciences;
- Provide a high-visibility forum to communicate both important developments in our traditional disciplines and creative new approaches using promising new technologies;
- Explore opportunities for earth science research and education via the World Wide Web; and
- Promote the importance of earth science and society, earth science education, and balancing between resource needs and environmental preservation.

We welcome proposals for Pardee Keynote Symposia and topical sessions; they must be sent via www.geosociety.org/meetings/2000 on or before January 10, 2000.

PROGRAM OPPORTUNITIES

The GSA 2000 Annual Meeting program structure offers opportunities for effective and dynamic program building and flexibility by allowing a mixture of invited and volunteered papers and different session formats. Joint Technical Program Committee (JTPC) representatives play a large role in program decisions. Descriptions of the various program options and guidelines are available at www.geosociety.org/meetings/2000. Some modifications have been made since last year; please read these guidelines carefully before submitting a proposal. Two types of sessions can be proposed:

Pardee Keynote Symposia. The Pardee Keynote Symposia are made possible by a grant from the Joseph T. Pardee Memorial Fund. These sessions are *special events* that should be of broad interest to

the geoscience community. Topics appropriate for these keynote symposia should be on the leading edge in a scientific discipline or area of public policy, address broad fundamental problems, be interdisciplinary, or focus on global problems. The primary criterion for selection is excellence. Selection is on a competitive basis with *only four to eight* half-day, non-concurrent (one per half day; minimum of one per day) sessions being offered. All speakers will be invited. We are striving for a good mix of Pardee Keynote Symposia, of interest to the GSA and Associated Society memberships.

Topical Sessions. These sessions are designed to promote the exchange of timely or state-of-the-art information with respect to a central topic and to allow scheduling of interdisciplinary talks that bear on a specific topic. Organizers (advocates) may invite specific

papers to ensure a successful and excellent session and are encouraged to solicit volunteered contributions. A maximum of four invited speakers is automatically allowed, but an advocate may request more invitations if he or she can justify the larger number. Volunteered abstracts will be automatically solicited in *GSA Today* for all approved topical sessions.

Oral and Poster General Sessions. Consisting entirely of volunteered papers, these sessions remain an important component of the GSA Annual Meeting. The number of abstracts received determines the number of general sessions in each discipline. The rejection rate for recent GSA Annual Meetings has been much less than 5%. The goal of the Technical Program Committee (TPC) and JTPC representatives is to provide presenters the best possible opportunity for communicating new scientific information rather than to dictate what can or will be presented. Poster sessions have been expanded to allow presentation of more papers. Poster sessions will not be scheduled concurrently with oral sessions in the same discipline, to allow for well-attended, dynamic sessions. This year a combined oral and poster session format in a technical session meeting room with poster boards is offered as an option.

2000 Schedule

January 10	Proposals due. <i>Firm deadline; electronic submission required.</i>
March 1	Paper copy of 2000 abstract forms will be available from Nancy Carlson at GSA, (303) 447-8850, ext. 161, ncarlson@geosociety.org . A set of forms will automatically be mailed to conveners and advocates in March.
May 1	Electronic abstract form will be on GSA home page for active submission: www.geosociety.org .
July 25	<i>Paper Submission Deadline.</i> Paper copy original and 5 copies due at GSA. Authors should submit all abstracts directly to GSA. <i>Firm deadline.</i> Paper abstracts will not be accepted after this date— <i>no exceptions.</i>
August 1	<i>Electronic Abstracts Deadline.</i> Electronic copies accepted until 12 midnight.
August 12	Schedule finalized.
September 1	All accepted abstracts will appear on the Web after September 1. All speakers and titles appear on the Web with links to these abstracts.

Session Proposals *continued on p. 11*

Reminder: Call for Nominations

PENROSE MEDAL

To be awarded for outstanding original contributions or achievements that mark a major advance in the science of geology. Scientific contributions should be considered rather than contributions in teaching, administration, or service. Mid-career scientists who have already made exceptional contributions should be given full consideration for this award. Nominations are due by February 1, 2000.

DAY MEDAL

To be awarded for outstanding distinction in contributing to geologic knowledge through the application of physics and chemistry to the solution of geologic problems. The intent is to recognize outstanding achievement and inspire further effort, rather than reward a distinguished career. Scientific achievements should be considered rather than contributions in teaching, administration, and service. Nominations are due by February 1, 2000.

HONORARY FELLOWS

To be awarded to non-North Americans who live and work outside of North America and have distinguished themselves in geological investigations or in notable service to the Society. Under exceptional circumstances, North Americans have been named Honorary Fellows. Nominations are due by February 1, 2000.

YOUNG SCIENTIST AWARD (DONATH MEDAL)

To be awarded to a young scientist (35 or younger during the year in which the award is to be presented) for outstanding achievement in contributing to geologic knowledge through original research that marks a major advance in the earth sciences. Nominations are due by February 1, 2000.

GSA PUBLIC SERVICE AWARD

To be awarded for contributions that have materially enhanced the public's understanding of the earth sciences or significantly served decision-makers in the application of scientific and technical information in public affairs and public policy related to the earth sciences. Nominations are due by February 1, 2000.

DISTINGUISHED SERVICE AWARD

To be awarded for exceptional service to the Society. GSA Members, Fellows, and Associates are eligible. Nominations are due by March 1, 2000.

JOHN C. FRYE ENVIRONMENTAL GEOLOGY AWARD

In cooperation with the Association of American State Geologists (AASG), GSA makes an annual award for the best paper on environmental geology published either by GSA or by one of the state geological surveys. The paper must be selected from GSA or state geological survey publications; it must be selected from those published during the preceding three full calendar years; and the nomination must include a paragraph stating the pertinence of the paper. Nominated papers must establish

an environmental problem or need, provide substantive information on the basic geology or geologic process pertinent to the problem, relate the geology to the problem or need, suggest solutions or provide appropriate land-use recommendations based on the geology, present the information in a manner that is understandable and directly usable by geologists, and address the environmental need or resolve the problem. It is preferred that the paper be directly applicable by informed laypersons (e.g., planners, engineers). Deadline for nominations for 2000 is March 31, 2000.

OFFICERS AND COUNCILORS

The GSA Committee on Nominations requests your help in compiling a list of GSA members qualified for service as officers and councilors of the Society. The committee requests that each nomination be accompanied by basic data and a description of the qualifications of the individual for the position recommended (vice-president, treasurer, and councilor). Nominations are due by February 15, 2000.

NATIONAL AWARDS

The deadline for the William T. Pecora Award, the National Medal of Science, the Vannevar Bush Award, and the Alan T. Waterman Award is April 30, 2000.

Materials and supporting information for any of the nominations may be sent to GSA Administrative Offices, Geological Society of America, P.O. Box 9140, Boulder, CO 80301-9140. For more detailed information about the nomination procedures, refer to the October 1999 issue of *GSA Today*, or call headquarters at (303) 447-2020, ext. 188.

Session Proposals *continued from p. 10*

Hot Topics. These popular lunchtime forums will be continued (one each day, Monday–Thursday). If you are interested in organizing one of these sessions or in being a Hot Topics chair, contact Technical Program Chair Bob Karlin. These sessions are different from technical sessions and are not to be talks by “experts.” Most of the one-hour time is for discussion, with audience participation. A debate format is recommended, and panels are discouraged. Each session must have a moderator. Titles should be catchy and provocative.

We strongly encourage you to participate in the 2000 GSA Annual Meeting in Reno! The new program initiatives inaugurated in 1999 are designed to encourage program excellence and to provide an opportunity for flexible scheduling and creativity. Topical session organizers have the ability to ensure a successful, excellent program, and all members may contribute papers to sessions with invited speakers. The Pardee Keynote Symposia expand the opportunity for high-profile sessions on significant scientific developments that have an impact on our science. Help us make the GSA Annual Meeting increasingly dynamic and stimulating for all GSA and Associated Society members as well as one that appeals to a wide audience. We look forward to working with you. If you have any questions or concerns regarding these program initiatives, please call or e-mail one of us:

Sharon Mosher, Annual Program Committee Chair
(through 1999), mosher@mail.utexas.edu.

Rob Van der Voo, Annual Program chair (2000–2001),
voo@umich.edu.

Bob Karlin, Technical Program Chair,
karlin@mines.unr.edu. ■

GSA Offers Travel Grants for 31st IGC in Rio de Janeiro

The Geological Society of America is accepting applications for the 31st International Geological Congress (IGC) Travel Grant Program. The 2000 IGC will be held in Rio de Janeiro, Brazil, August 6–17. This program was established as a final act of the Organizing Committee for the U.S.-hosted 28th IGC held in Washington, D.C., in July 1989. The fund's purpose is to support the attendance of young geoscientists at non-U.S. IGCs. Travel grants will consist of economy airfare to Brazil.

To be eligible, an applicant must be a resident or citizen of the United States (includes students); must have a birth date after August 31, 1960; and must have an abstract for inclusion in the program of the 31st IGC.

Official application forms are available from the Grants Administrator, GSA Headquarters, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301. Along with the form, applicants must include a copy of the abstract that was submitted to the 31st IGC. Applications must be supported by two letters from current or recent supervisors; students may use faculty members. Qualifying applications and letters of support must be postmarked no later than February 15, 2000. Applicants will be notified of results by April 3, 2000. ■

GSA FOUNDATION UPDATE

Donna L. Russell, Director of Annual Giving

Easterbrook Fund Established

Through the generosity of Don and Ellen Easterbrook, a new fund has been established within the GSA Foundation. The Don J. and Ellen H. Easterbrook Fund will provide a research grant to the Don J. Easterbrook Distinguished Scientist award recipient, as selected by GSA's Quaternary Geology and Geomorphology Division. The first award will be made during the GSA Annual Meeting in Reno in 2000. The award will initially be in the range of \$15,000–\$30,000, and grants may eventually reach \$100,000 or more annually.

The Easterbrook Fund will also provide support for other scientific projects in Quaternary geology and geomorphology, including acquiring, archiving, and disseminating outstanding photographs, satellite and digital elevation images, and various other types of images for the Easterbrook Library of Outstanding Geologic Photos. In addition, as the fund grows, support for publications, education, research, and other programs will be available.

Easterbrook, a GSA member since 1960 and professor of geology at Western Washington University since 1968, earned his B.S. in geology, M.S. with honors in geology, and Ph.D. in geology from the University of Washington. He has held offices in national and international professional societies and has published many papers on glacial geology, geomorphology, slope stability, and volcanic processes, in addition to several books on surface processes and landforms.

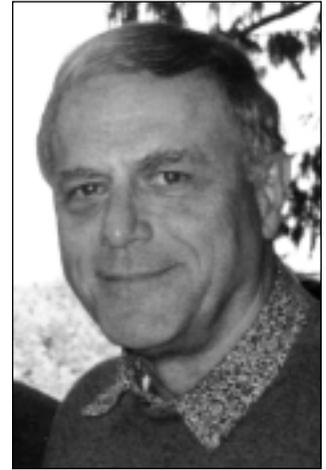
When asked about the genesis of this very significant geologic and financial decision, Don Easterbrook replied, "Ellen and

I have been thinking for some time about ways to return to our science some of the intellectual benefits that have made our lives enjoyable for more than 40 years. Looking back at my own career and that of others, the one thing there was never enough of was money, to follow and develop all the ideas that we geologists have a propensity to spawn. With the realization that through GSA and the Foundation we could establish a fund that would accomplish what we wanted to do through current gifts now and an endowment later, everything fell into place."

GSA President Gail Ashley said, "Don and Ellen Easterbrook have given us a unique, two-part way, first, to recognize scientists who in their work have made breakthrough discoveries and significantly advanced scientific knowledge, and, second, to reward them generously with research funds that will give them the wherewithal to make even greater contributions. All of us in GSA and earth science are in their debt."

Remember

Your December contribution must be postmarked by December 31, 1999, so that it can be counted as a deduction on your 1999 tax return. Please use the coupon below, or call the Foundation office—(303) 447-2020, ext. 154—and we can take your credit card number over the phone. ■



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Cleaves & his great
contribution to engineering
geology. He was a good friend.

North-Central Section
Endowment
George R. Hallberg♦
Norris W. Jones♦
C. Pius Weibel♦

Northeastern Section
Endowment
Frederick L. Klinger♦
Kathryn H. Lohmeyer♦
Joseph E. Nadeau♦
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Julie J. Dieu*
Paul D. Fullagar*
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Paul E. Hammond*
Richard L. Hay*
Melvin J. Hill*
William W. Jenney, Jr.*
Robert G. Johnson
Norris W. Jones*
Edmund Kiessling*
Frederick L. Klinger*
Kathryn H. Lohmeyer*
Jack B. Mills
Joseph E. Nadeau*
Robert M. Norris *in honor of*
Prof. Robert W. Webb
Jerry C. Olson
William D. Romey*
Paul R. Seaber
Marshall K. Shurnas
Betty Ann Lindberg Skipp*
Asahiko Taira
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Women in Science
William A. Clemens, Jr.*
Albert C. Holler

*Century Plus Roster
(*gifts of \$150 or more*).

*Second Century Fund.



Loper Chair in Environmental Geology The University of Alabama

The Department of Geological Sciences invites applications and nominations for the Loper Chair in Environmental Geology. The successful candidate will have a distinguished record of scientific publication and externally supported research, and will be expected to develop a nationally recognized graduate program in their specialty area at the University of Alabama. Appointment will be made at the rank of full professor. Qualified scientists are encouraged to apply who have expertise in any area of Environmental Geology which would enhance our existing graduate programs in aqueous environmental geochemistry, hydrogeology, and surficial processes.

Applications/nominations should be sent to: **Dr. Rona J. Donahoe, Chair, Loper Chair Search Committee, Department of Geological Sciences, The University of Alabama, Tuscaloosa, Alabama 35487-0338.** The search committee will begin to review applications on February 1, 2000, but applications will be received and considered until the position is filled. Prospective candidates are encouraged to review the Department's web site at <http://www.geo.ua.edu>. The University of Alabama is an equal opportunity, affirmative action employer.



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NORTHEASTERN SECTION, GSA 35th Annual Meeting

New Brunswick, New Jersey
March 13-15, 2000

www.geosociety.org/profdev/sectdiv/northe/00nemtg.htm

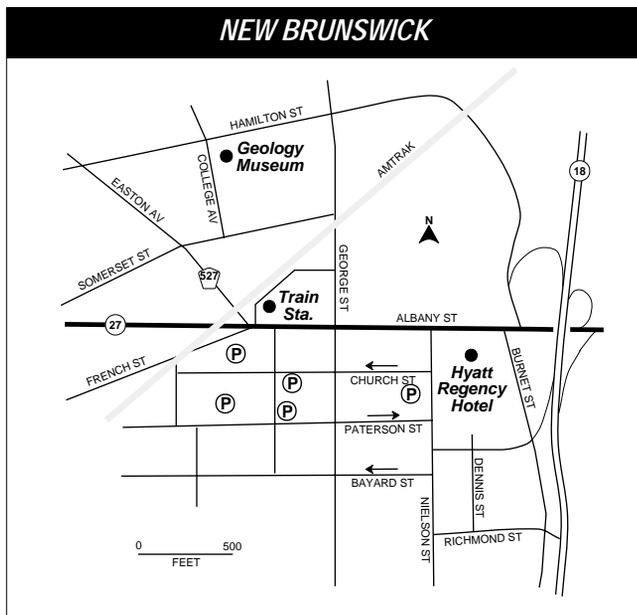
The hosts for the 2000 meeting of the Geological Society of America Northeastern Section are geologists from Rutgers University in New Brunswick, Rutgers University in Newark, the New Jersey Geological Survey, Stockton State College, and Rider University. Meeting in conjunction with the GSA Northeastern Section will be the Eastern Section of SEPM, the Northeastern Section of the Paleontological Society, the Eastern and New England Sections of the National Association of Geoscience Teachers, the Association for Women Geoscientists, and the Council on Undergraduate Research Geology Division.

REGISTRATION

Preregistration deadline:
February 4, 2000

Members of GSA and the associated societies listed on the preregistration form get preregistration discounts. Students and

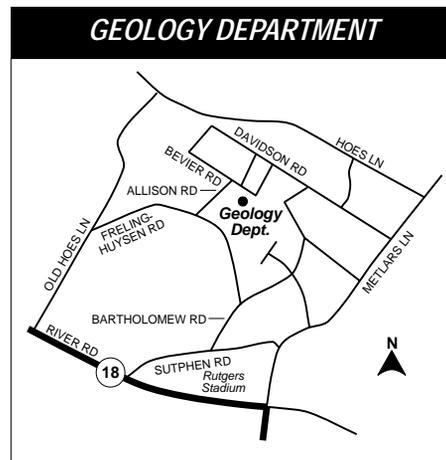
K-12 teachers must send or show a *current ID* in order to obtain these rates. Preregistration forms must be received at GSA no later than *February 4, 2000*. Register only one professional or student per form and retain a copy for your records. If you preregister, your badge will be mailed to you two weeks prior to the meeting. For detailed information, visit the Web site given above.



Cancellations, Changes, and Refunds

All requests for additions, changes, and cancellations must be made in writing and received by *February 11, 2000*. There will be NO refunds for on-site registration, *Abstracts with Programs*, and ticket sales.

Members pay less! You can join now or at the meeting. Contact GSA Headquarters at (303) 447-2020 for further information.



ONSITE REGISTRATION SCHEDULE

Hyatt Regency, pre-function area

Sunday, March 12	4-8 p.m.
Monday, March 13	7 a.m.-4:30 p.m.
Tuesday, March 14	7 a.m.-4:30 p.m.
Wednesday, March 15	7-10 a.m.

ACCESSIBILITY FOR REGISTRANTS WITH SPECIAL NEEDS

The GSA Northeastern Section is committed to making every event at its 2000 meeting accessible to all people interested in attending. If you have special requirements (such as an interpreter or wheelchair accessibility), indicate this on the meeting registration form, or contact Robert Sheridan, Dept. Geological Sciences, Rutgers University, New Brunswick, NJ 08903, (732) 445-2015, fax (732) 445-3374, rsheridn@rci.rutgers.edu. Please let us know of your needs by February 4, 2000.

LOCATION AND DIRECTIONS

Meeting registration, technical sessions, poster sessions, and exhibits will be in the Hyatt Regency Hotel, New Brunswick, New Jersey. See maps printed here, or the GSA Web site, or request a printout of the full announcement (GSA Northeastern Section Meeting, P.O. Box 9140, Boulder, CO 80301-9140), for detailed directions.

TECHNICAL PROGRAM

Oral sessions will normally include 15 minutes for presentation and 5 minutes for questions and discussion. Two 35mm carousel slide projectors, two screens, and one overhead projector will be provided for each oral session. Speakers are encouraged to bring their slides already loaded into carousel trays.

Speaker-Ready Room. The room will be open Sunday, March 12, 6-10 p.m., Monday, March 13 and Tuesday, March 14, 7-9 p.m., and Wednesday, March 15, 7 a.m.-noon. Additional carousel trays may be signed out from the speaker-ready room. Computer technology or Internet access will be provided at direct additional cost to the presenter(s). Contact Peter Sugarman, New Jersey Geological Survey, (609) 292-2576, Petes@njgs.state.nj.us.

Poster sessions

Poster sessions will allow three hours of display time; the authors must be present for two hours. Two 4'x4' and one 4'x8' tack boards will be provided for each U-shaped booth. Access to electrical outlets and furniture for poster sessions must be requested well in advance. Contact Alec Gates, Rutgers University, (973) 353-5034, agates@andromeda.rutgers.edu.

Symposia

For general information, contact Symposium Co-chairs Gail M. Ashley or Peter A. Rona, Dept. of Geological Sciences, Rutgers, 610 Taylor Rd., Piscataway, NJ 08854-8066, (732) 445-2221 or -6342, gmashley@rci.rutgers.edu or rona@ahab.rutgers.edu., or visit www.geosociety.org on the Web.

1. Holocene Climate Change in Northeast U.S. and Adjacent Oceans. David A. Robinson, Rutgers University, (732) 445-4741, drobins@rci.rutgers.edu; James D. Wright, Rutgers University, (732) 445-3622, jdwright@rci.rutgers.edu.

2. Radium, Radon, and Short-Lived Radionuclides: Occurrence and Human Exposure. Zoltan Szabo, U.S. Geological Survey, (609) 771-3929, zszabo@usgs.gov. Oral and Poster.

3. Influence of Urbanization on River Form and Process. Jim Pizzuto, University of Delaware, (302) 831-2710, pizzuto@udel.edu; W. Cully Hession, Philadelphia Academy of Natural Sciences, (610) 566-5414, hession@acnatsci.org.

4. Lacustrine Record of Global Environmental Change. (Poster). Henry T. Mullins, Syracuse University, (315) 443-4706; William P. Patterson, Syracuse University, (315) 443-3869.

5. Coastal Hazards and Management in the Mid-Atlantic Bight. *Sponsored by NEGSA Committee for Geology and Public Policy.* Susan Halsey, New Jersey Department of Environmental Protection, (609) 292-0950, shalsey@dep.state.nj.us; Nicholas Coch, City University of New York, (212) 642-2202.

6. Evidence for the Assembly and Breakup of Rodinia in the Appalachians. Alec E. Gates, Rutgers University, (973) 353-5034, agates@andromeda.rutgers.edu; Richard Volkert, New Jersey Geological Survey, (609) 292-2576, richv@njgs.dep.state.nj.us.

7. Effectiveness of K-16 Collaboration in Geoscience Education. *Sponsored by NAGT.* Richard F. Yuretich, University of Massachusetts, (413) 545-0538, yuretich@geo.umass.edu; Richard D. Little, Greenfield Community College, (413) 775-1445, little@gcc.mass.edu.

8. Appalachian Basin Stratigraphy: Sequences in an Active Tectonic Basin. *Sponsored by Northeastern Section of SEPM.* Chuck Mitchell, SUNY Buffalo, (716) 645-6800 ext. 3991, cem@nsm.buffalo.edu; Robert Jacobi, SUNY Buffalo, (716) 645-6800, rdjacobi@acsu.buffalo.edu.

9. Environmental Geophysics (Poster). Samuel Peavy, Rutgers University, (973) 353-1851, peavy@andromeda.rutgers.edu.

Theme Sessions

For general information, contact Gail M. Ashley or Peter Rona (see Symposia).

HOUSING FORM — Hyatt Regency, New Brunswick, New Jersey

Northeastern Section, Geological Society of America
Sunday, March 12–Wednesday, March 15

Arrival Date _____ Departure Date _____

PERSON REQUESTING HOUSING (type or print)

Last Name _____ First _____

Institution or Firm _____

Address or P.O. Box _____

City _____ State/Province _____ ZIP Code _____

Phone: () _____ Work () _____ Home _____

Place reservation in name of: _____

Name of all other occupants:

RATES PER ROOM* (Kings/Doubles) (*price does not include 6% state sales tax.*)

Single Occupancy—\$137; Double/Triple/Quad Occupancy—\$162/\$187/\$212

Check-in time is 3 p.m. (earlier on request), Check-out time is noon.

SPECIAL NEEDS Smoking Room Nonsmoking Room Special Room
 Special Room Requirements _____

*Enclose check or money order (for amount of one night's lodging) payable to Hyatt Regency New Brunswick or major credit card number and date of expiration. No cancellations accepted within 48 hours of arrival.

Reservations must be received prior to February 21, 2000; reservations received after that date will be accepted on a space-available basis only and the group rate will not be guaranteed. Telephone reservations accepted: (732) 873-1234; (800) 233-1234; fax 732-873-1382.

Type of Card _____ Card Number _____

Name as it appears on the credit card _____

Exp. Date _____ Signature _____

SEND THIS FORM AND REMITTANCE OR CREDIT CARD INFORMATION TO:
Reservations, Hyatt Regency, 2 Albany Street, New Brunswick, NJ 08901.

1. Holocene Sea Level: Magnitudes and Frequency of Events. Norbert Psuty, Rutgers University, (732) 932-6555 ext. 506/500, psuty@imcs.rutgers.edu; Joseph Kelley, University of Maine, (207) 581-2162, jtkelley@maine.maine.edu.
2. Late Cretaceous to Cenozoic Sea Level, Sequences, and the U.S. Atlantic Margin. Gregory S. Mountain, Lamont-Doherty Earth Observatory, (914) 365-8540, mountain@ideo.columbia.edu; Kenneth G. Miller, Rutgers University, (732) 445-3374, kgm@rci.rutgers.edu.
3. East Coast Rift Basins and Late Triassic-Early Jurassic Paleoclimatology. Dennis V. Kent, Rutgers University, (732) 445-6974, dvk@rci.rutgers.edu; Paul E. Olsen, Lamont-Doherty Earth

Observatory, (914) 365-8491, polsen@ideo.columbia.edu.
4. Filling the Rift: Modern and Ancient Sedimentary Systems in Rift Valleys. *Sponsored by Northeastern Section of SEPM.* Craig S. Feibel, Rutgers University, (732) 932-8853, feibel@rci.rutgers.edu; Gail M. Ashley, Rutgers University, (732) 445-2221, gmashley@rci.rutgers.edu.
5. Fracture Populations, Scaling Laws, and the Mechanics of Fracturing. Roy W. Schlische, Rutgers University, (732) 445-3142, schlisch@rci.rutgers.edu.
6. Sedimentary Processes and Their Impacts across the Mid-Atlantic U.S. Continental Margin. Lincoln F. Pratson, Duke University, (919) 681-8077, pratson@eos.duke.edu.

Northeastern *continued on p. 16*

Northeastern *continued from p. 15*

7. Value of Geologic Research in Public Lands. Jack B. Epstein, U.S. Geological Survey, Reston, Virginia, (703) 648-6944, jepstein@usgs.gov; Donald Monteverde, New Jersey Geological Survey, Trenton, (609) 984-7929, donm@njgs.dep.state.nj.us.

8. Taphonomy: Case Studies in the History of Fossils from Death Until Discovery. *Sponsored by Paleontological Society.* Cindy Fisher, West Chester (Pennsylvania) University, (610) 436-2108, cfisher@wcupa.edu; Christopher McRoberts, SUNY Cortland, (607) 753-2925, mcroberts@cortland.edu.

9. Linking Terrestrial and Marine Records of Glaciations in the Northeast. Scott Stanford, New Jersey Geological Survey, Trenton, (609) 292-2576, scott@s@njgs.dep.state.nj.us.

10. Appalachian Basin Stratigraphy: Sequences in an Active Tectonic Basin. *Sponsored by Northeastern Section of SEPM.* Chuck Mitchell, SUNY Buffalo, (716) 645-6800 ext. 3991, cem@nsm.buffalo.edu; Robert Jacobi, SUNY Buffalo, (716) 645-6800, rdjacobi@acsu.buffalo.edu.

11. Undergraduate Research. *Sponsored by the Council on Undergraduate Research Geology Division.* (Poster) David G. Bailey, Hamilton College, Clinton, New York, (315) 859-4142, dbailey@hamilton.edu.

SHORT COURSES

Short course and workshop coordinator is Kathy Browne, Rider University, Lawrenceville, New Jersey, (609) 896-5346, browne@enigma.rider.edu.

Mechanics of Sediment Transport. *Sponsored by Northeastern Section of SEPM.* Sunday, March 12, 9 a.m.-5 p.m., Room 231, Wright-Reiman Labs, Dept. of Geological Sciences, Rutgers University. Professionals \$40, students \$30; maximum 40, minimum 10. Lunch not included. John Southard, Massachusetts Institute of Technology, (617) 253-2127, Southard@MIT.edu.

X-ray Fluorescence Spectroscopy in the Geological Sciences: An Introduction to Theory, Methods, and Applications. Sunday, March 12, 9:30 a.m.-4:30 p.m., Hyatt Regency, Douglass-Kilmer Room. Professionals \$40, students \$30; maximum 20, minimum 6. David Coler, Philips Analytical, Nantick, Massachusetts, (508) 647-1182, david.coler@philips.com.

WORKSHOP

Roy Shlemon Mentor Program in Applied Geology. Sunday, March 12, 1 p.m.-5 p.m., Room 339, Wright-Reiman Labs, Rutgers University. Career Interests in Consulting: Some Practical Advice for graduate and advanced undergraduate stu-

dents. A workshop on professional opportunities and challenges in the applied geosciences. Cost: \$10; maximum 40, minimum 10.

FIELD TRIPS

The field trip coordinator is Ray Mueller, Stockton College, Pamona, New Jersey, (609) 652-4209, Ray.Mueller@stockton.edu. For a full description of all trips, see the Web site address at the beginning of this announcement.

1. Syenitic and Trondhjemitic Fusion at Mesozoic Diabase Intrusive Contacts with Sedimentary Rocks of Northern New Jersey and Staten Island, New York. Sunday, March 12, 8 a.m.-5 p.m. John H. Puffer, Rutgers University, (973) 353-5238, jpuffer@andromeda.rutgers.edu; Alan Benimoff, College of Staten Island, (718) 982-2835, benimoff@postbox.csi.cuny.edu. Maximum 25, minimum 12. Professionals \$55, students \$45.

2. Paleontology of Upper Cretaceous and Lower Tertiary Sequences in the Atlantic Coastal Plain of New Jersey. Thursday, March 16, 9 a.m.-5 p.m. William Gallagher and David Parris, New Jersey State Museum, Trenton, (609) 292-6330, wgallagh@museum.sos.state.nj.us. Maximum 30, minimum 10. Professionals \$55, students \$45.

STUDENT AWARDS AND TRAVEL ASSISTANCE

The GSA Northeastern Section will give awards for the best oral paper and best poster session presented by students. Designate papers submitted for this award on the abstract form.

The Northeastern Section will award travel grants to students who present papers as author or co-author and presenter at the meeting. The section will also award student research grants to undergraduates in 2000. Applications for travel assistance and guidelines for student research proposals are available from Kenneth N. Weaver, Secretary-Treasurer, Northeastern Section, GSA, c/o Maryland Geological Survey, 2300 St. Paul St., Baltimore, MD 21221-5210, (410) 554-5532, fax 410-554-5502.

EXHIBITS

Exhibits will be available in the Hyatt Regency Hotel. Deadline for reserving space is *March 1, 2000*. Contact James Wright, Dept. of Geological Sciences, Rutgers, 610 Taylor Rd., Piscataway, NJ 08854-8066, (732) 445-5722, jdwright@rci.rutgers.edu; or Greg Herman, New Jersey Geological Survey, (609) 292-2576, gregh@njgs.dep.state.nj.us.

SPECIAL EVENTS

GSA Northeastern Section Management Board Meeting. Sunday, March

12, 5-7 p.m. Hyatt Regency, Douglass-Kilmer Room.

Welcoming Reception. Sunday, March 12, 6-9 p.m. Hyatt Regency Atrium. Paleontological Society Northeastern Section Luncheon. Monday, March 13, noon-1:30 p.m., Hyatt Regency, Douglass-Kilmer Room. Professionals \$27, students \$15. Preregistration required. Limit 20.

SEPM Eastern Section Business Meeting and Reception. Monday, March 13, 5-7 p.m.

Rutgers University Geology Museum Open House. Monday, March 13, 5-7 p.m. William Selden, Curator, (732) 932-7243, rwselden@rci.rutgers.edu.

INQUA Project. Inter-basinal Correlations of Sedimentary Sequences in Africa. Monday, March 13, 7-8 p.m., Board Room. Limit 10.

Map Blast III. Monday, March 13, 7:30-9:30 p.m. An informal session for display and discussion of newly published, unpublished, or in-progress geologic maps of any sort. Contact Richard Volkert or Donald Monteverde, New Jersey Geological Survey, (609) 292-2576, richv@njgs.dep.state.nj.us.

Association for Women Geoscientists Breakfast. Tuesday, March 14, 6-8:30 a.m., Hyatt Regency, Douglass-Kilmer Room. Professionals \$15, students \$10. Preregistration required. Limit 20.

Northeastern Section of NAGT Luncheon and Business Meeting. Tuesday, March 14, noon-1:30 p.m. Hyatt Regency, Douglass-Kilmer Room. Professionals \$27, students \$15. Preregistration required. Limit 20.

GSA Northeastern Section Reception and Banquet. Tuesday, March 14, 6-9 p.m., Hyatt Regency Ballroom. Professionals \$31-35; students \$20. Preregistration required for the banquet.

ACCOMMODATIONS

Meeting participants will get special rates at the Hyatt Regency, New Brunswick, 1-800-233-1234 or (732) 873-1234, fax 732-873-1382. Single-\$137 plus tax; double/triple/quad-\$162/\$187/\$212 respectively, plus tax. Reservation deadline is *February 21, 2000*. When making reservations by phone, state that you are attending the Geological Society of America Northeastern Section Meeting.

DETAILED INFORMATION

For additional information or suggestions contact the general chair, Robert E. Sheridan (732) 445-2015, fax (732) 445-3374, Dept. of Geological Sciences, Rutgers, 610 Taylor Rd., Piscataway, NJ 08854-8066, rsheridn@rci.rutgers.edu. For a paper copy of the full meeting announcement, call GSA at (303) 447-2020, ext. 239. See first page for GSA Web site address. ■

PREREGISTRATION FORM

New Brunswick, New Jersey
March 13-15, 2000

GSA Northeastern Section

Preregistration Deadline: February 4, 2000
Cancellation Deadline: February 11, 2000

Register one professional or student per form.
Copy form for your records.

Please print clearly • THIS AREA IS FOR YOUR BADGE

First Name _____ Last Name _____
 Employer/University Affiliation _____
 City _____ State or Country _____

Mailing Address (use two lines if necessary) _____

 City _____ State _____ Country (if other than USA) _____
 ZIP Code _____ Male Female
 Business Phone _____
 Fax _____
 Home Phone _____
 E-mail _____

GUEST INFORMATION • Please print clearly • This area is for badge

First Name _____ Last Name _____ Male Female
 City _____ State or Country _____

MAIL TO:
GSA NORTHEASTERN SECTION MEETING, P.O. BOX 9140, BOULDER, CO 80301
OR
FAX TO: 303-443-1510 or 303-447-1133

Remit in U.S. funds payable to: 2000 GSA Northeastern Section Meeting
(All preregistrations must be prepaid. Purchase Orders not accepted.)

Payment by (check one): Check # _____ American Express
 VISA MasterCard Discover Diners Club

Card Number _____ Expires _____
 Signature _____

PREREGISTRATION FEES

	Full Meeting	One Day	Qty.	Amount
Professional Member*	(10) \$70 <input type="checkbox"/>	(11) \$45 <input type="checkbox"/>	_____	\$ _____
Professional Member (70 & older)*	(12) \$25 <input type="checkbox"/>	(13) \$20 <input type="checkbox"/>	_____	\$ _____
Professional Nonmember	(14) \$95 <input type="checkbox"/>	(15) \$60 <input type="checkbox"/>	_____	\$ _____
Student Member*	(30) \$27 <input type="checkbox"/>	(31) \$22 <input type="checkbox"/>	_____	\$ _____
Student Nonmember	(32) \$37 <input type="checkbox"/>	(33) \$32 <input type="checkbox"/>	_____	\$ _____
K-12 Professional	(60) \$35 <input type="checkbox"/>	(61) \$20 <input type="checkbox"/>	_____	\$ _____
Guest or Spouse	(90) \$20 <input type="checkbox"/>	NA <input type="checkbox"/>	_____	\$ _____
Field Trip Only	(95) \$5 <input type="checkbox"/>	NA <input type="checkbox"/>	_____	\$ _____

*Member fee applies to any current Professional OR Student Member of GSA or Associated Societies listed below.
 Discount does not apply to guest registrants.

(1) GSA (member # _____) (2) AWG (3) CUR (4) NAGT (5) PS (6) SEPM

TICKETED EVENTS

- Paleontological Society Luncheon March 13
 Professional (301) \$27 _____
 Student (302) \$15 _____
 - AWG Breakfast March 14
 Professional (303) \$15 _____
 Student (304) \$10 _____
 - NAGT Luncheon March 14
 Professional (305) \$27 _____
 Student (306) \$15 _____
 - Annual Banquet March 14
 Beef \$35 (307) _____
 Chicken \$33 (309) _____
 Veggie \$20 (308) _____
 Professional \$20 (310) _____
 Student \$20 (311) _____
 Student \$20 (312) _____
- WORKSHOP**
- Roy Shlemon Mentor Program March 12 (601) \$10 _____
- SHORT COURSES**
- Mechanics of Sediment Transport March 12
 Professional (501) \$40 _____
 Student (502) \$30 _____
 - X-ray Fluorescence Spectroscopy March 12
 Professional (503) \$40 _____
 Student (504) \$30 _____

FIELD TRIPS (Separate registration forms required for each field trip participant.)

- Diabase Intrusive Contacts March 12
 Professional (401) \$55 1 \$ _____
 Student (402) \$45 1 \$ _____
- Cretaceous/Tertiary Paleontology March 16
 Professional (403) \$55 1 \$ _____
 Student (404) \$45 1 \$ _____

TOTAL FEES REMITTED \$ _____

FOR OFFICE USE	
A/R	DR _____ CR _____
Refund	_____
Refund ck#	_____

 Please inform us by February 4 of any special considerations that you or your guest require.
 I will need special considerations.

SOUTHEASTERN SECTION, GSA 49th Annual Meeting

Charleston, South Carolina
March 22–24, 2000

www.geosociety.org/profdev/sectdiv/southe/00semtg.htm
or www.geo.ua.edu/segasa/segasa.html

The 2000 meeting of the Southeastern Section of the Geological Society of America in Charleston, South Carolina, will be hosted by the College of Charleston Department of Geology and will be held at the Westin Francis Marion Hotel and the adjacent Lightsey Conference Center, which are within easy walking distance of the downtown historical and cultural areas

REGISTRATION

Meeting Preregistration Deadline:
February 11, 2000

Preregister to qualify for lower registration fees. Field trip participants must preregister for the meeting. Use the preregistration form in this announcement or on the GSA Web page. Full payment MUST accompany the preregistration form.

Guest registration is required for those attending guest activities, technical sessions, or the exhibit hall. Guest registrants (nongeologist spouse or friend) must be accompanied by either a registered professional or student. Students and K-12 teachers must show a current ID in order to obtain reduced rates. If you preregister, your badge will be mailed to you two weeks prior to the meeting. All registrations received after February 11 will be held for on-site processing and charged the on-site rates.

All requests for registration additions, changes, and cancellations must be made in writing and received by February 18, 2000. There will be no refunds for cancellations received after this date.

On-site Registration Schedule

Westin Francis Marion, second floor, next to the Gold Room.

Wednesday, March 22 4:30 p.m.–7 p.m.

Thursday, March 23 7:30 a.m.–4:30 p.m.

Friday, March 24 7:30 a.m.–12 noon

Accessibility for Registrants with Special Needs

GSA is committed to making the Southeastern Section meeting accessible to all people interested in attending. If you need any auxiliary aids or services because of a disability, check the appropriate box on the registration form. If you need more information, please contact June Mirecki at (843) 953-8278, mireckij@cofc.edu, for more information. Requests for needs should be received by February 11, 2000.

ACCOMMODATIONS

Hotel Accommodation Deadline:
February 11, 2000

The Westin Francis Marion (387 King St., Charleston) will offer special rates for attendees: \$99 per night for an economy room, \$139 for a deluxe room (rates include double occupancy). Attendees must make their own room reservations by calling (800) 433-3733 or consulting the hotel's Web page, making sure to mention that you are attending SEGSA 2000. Additional rooms are available at the Holiday Inn Historic District, 1255 Calhoun Street, Charleston (\$129 single, \$139 double), (843) 805-7900. Rates do not include 12% sales tax.

WELCOME PARTY

The welcoming party will be held on Wednesday, March 22 from 6 to 8 p.m. in the Gold Room of the Westin Francis Marion hotel.

KEYNOTE ADDRESS

"The Charleston 1886 Earthquake—The Y2K Perspective." Pradeep Talwani, Director, South Carolina Seismic Network. Thursday, March 23, 5:15 p.m., Lightsey Center Auditorium.

SYMPOSIA

1. Role of Geology in Coastal Restoration. Richard A. (Skip) Davis, Jr., University of South Florida, (813) 974-2773, rdavis@chuma.cas.usf.edu; Orrin H. Pilkey, Duke University, (919) 684-5847, opilkey@geo.duke.edu. Oral and poster.
2. The Bald Head Island Conferences on Coastal Plain Geology Revisited; A Memorial to Victor A. Zullo. W. Burleigh (Bill) Harris, (910) 962-3492, harrisw@uncwil.edu; Patricia H.

(Tricia) Kelley, (910) 962-3490, kelleyp@uncwil.edu; Richard A. Laws, (910) 962-3490, laws@uncwil.edu, all at University of North Carolina, Wilmington. Oral and poster.

3. New Strategies for Interpreting the Coastal Plain of South Carolina: A Memorial to Donald J. Colquhoun. David C. Prowell, U.S. Geological Survey, Atlanta, Georgia, (770) 903-9100, dprowell@usgs.gov; and Karen E. Waters, (803) 737-0800 waters@water.dnr.state.sc.us, and Joseph A. Gellici, gellici@water.dnr.state.sc.us, both at South Carolina Dept. of Natural Resources, Columbia. Oral and poster.
4. A Century of Progress in Southern Appalachian Tectonics. William A. (Bill) Thomas, University of Kentucky, Lexington, (606) 257-6222, geowat@pop.uky.edu. Oral.
5. Planetary Geology in the Southeastern Section. Harry A. (Hap) McSween, University of Tennessee, Knoxville, (423) 974-9805, mcsween@utk.edu. Oral.

6. Geomorphology-Blackbeard's Flagship Queen Anne's Revenge Returns to Charleston. John E. Callahan, Appalachian State University, Boone, North Carolina (828) 262-2746, callahnje@appstate.edu; Mark Wilde-Ramsing, North Carolina Dept. of Environment and Natural Resources, Wilmington, (901) 458-9042, mramsing@ncsl.dcr.state.nc.us. Oral.

7. Structure and Tectonics Symposium in Honor of Donald T. Secor, Jr. Allen J. Dennis, University of South Carolina Aiken, (803) 641-3396, dennis@sc.edu; and John W. Shervais, University of South Carolina, Columbia, (803) 777-2669, shervais@sc.edu. Oral.

8. Structural Geology, Metamorphism, and Geochronology Along the Eastern-Western Blue Ridge Contact. Charles H. Trupe, Georgia Southern University, Statesboro, (912) 681-0337, chtrupe@gsaix2.cc.gasou.edu; Kevin G. Stewart, University of North



For directions to Charleston, see <http://www.mapquest.com>.

Carolina, Chapel Hill, (919) 966-4519, kgstewar@email.unc.edu. Oral.

9. Shoreline and Shoreface Geology of the Carolinas: Recent Advances. William J. Cleary, University of North Carolina, Wilmington, (910) 256-3721 ext. 251, clearyw@uncwil.edu; Stanley R. Riggs, East Carolina University, Greenville, North Carolina, (252) 328-6379, riggs@mail.ecu.edu. Oral.

10. Paleontology's Contributions to Environmental Science. Sponsored by the Paleontological Society. Michael Savarese, Florida Gulf Coast University, Ft. Myers, (941) 590-7165, msavarese@fgcu.edu. Oral.

11. Gold—Its Geology and Heritage in Celebration of the Bicentennial of America's First Gold Rush. Dennis J. LaPoint, Appalachian Resources, Chapel Hill, North Carolina, (919) 408-0069, rknapp@ncsl.dcr.state.nc.us; Richard C. Knapp, North Carolina Division of Archives and History, (919) 733-7862. Oral.

THEME SESSIONS

1. Hydrology at the Land's Edge: Sea Water Intrusion, Submarine Discharges and Groundwater Geochemical Fluxes. W. Berry Lyons, University of Alabama, (205) 348-0583, blyons@wgs.geo.ua.edu; Anne E. Carey, University of Alabama, (205) 348-4008, acarey@coe.eng.ua.edu. Oral.

2. From the Mountains to the Sea: The Biogeochemistry of Surface Waters in the Southeast. C. Brannon Andersen, Furman University, Greenville, South Carolina, (864) 294-3366, brannon.andersen@furman.edu; and William Brian Hughes, U.S. Geological Survey, Water Resources Division, Columbia, South Carolina, (803) 750-6106, wbhughes@usgs.gov. Oral.

3. Innovative Applications of GIS Technology to Geological Research. *Sponsored by Sigma Gamma Epsilon.* Douglas W. Haywick, (334) 460-6381, dhaywick@jaguar1.usouthal.edu; David T. Allison, dallison@jaguar1.usouthal.edu, both at University of South Alabama, Mobile. Poster and oral.

4. The Geologist as Informant: Assessing Geohazard Risks and Raising Public Awareness. *Sponsored by the GSA Committee for Geology and Public Policy.* Peter J. Lemiszki, Tennessee Division of Geology, Knoxville, (423) 594-5598, plemiszki@mail.state.tn.us; Earl A. Shapiro, Georgia Department of Natural Resources, Atlanta, (404) 656-2833. Oral.

5. Geology and Military History. *Sponsored by GSA and NAGT Southeastern Sections Education Committees.* Robert C. Whisonant, Radford University, Radford, Virginia, (540) 831-5224; rwhisona@runet.edu; Roger J. Cuffey, Penn State University, University Park, (814) 865-1293, cuffey@ems.psu.edu. Oral.

6. Petrographic and Chemical Methods in the Analysis and Interpretation of Historic Artifacts. Michael S. Smith, University of North Carolina, Wilmington, (910) 962-3496, smithms@uncwil.edu. Poster and oral.

7. A Century of Progress in Southern Appalachian Tectonics. William A. Thomas, University of Kentucky, Lexington, (606) 257-6222, geowat@pop.uky.edu; Robert D. Hatcher, Jr., University of Tennessee-Knoxville, (423) 974-6565, bobmap@utk.edu. Oral.

8. Undergraduate Research. *Sponsored by the Council for Undergraduate Research.* C. Brannon Andersen, Furman University, Greenville, South Carolina, (864) 294-3366, brannon.andersen@furman.edu; Joel B. Thompson, Eckerd College, St. Petersburg, Florida, (813) 864-8991, thompsjb@eckerd.edu. Poster.

9. Gold—Its Geology and Heritage in Celebration of the Bicentennial of America's First Gold Rush. Dennis J. LaPoint, Appalachian Resources, Chapel Hill, North Carolina, (919) 408-0069, dlapoint@mindspring.com; Richard C. Knapp, North Carolina Division of Archives and History, (919) 733-7862, rknapp@ncsl.dcr.state.nc.us. Oral.

10. Impact of Inland Flooding from Hurricane Floyd and Other Rainfall Events in North Carolina and Virginia, September–October 1999. Stephen B. Harper, (252) 328-6773, harpers@mail.ecu.edu, and Richard K. Spruill, (252) 328-4399, spruillr@mail.ecu.edu, Department of Geology, East Carolina University, Greenville, NC 27858. Oral and poster.

PROJECTION EQUIPMENT

Two 35-mm slide projectors and two screens will be available for each oral technical session. Overhead projectors will also be available.

POSTER SESSIONS

Four half-day poster sessions are planned. Poster contributions are encouraged because they permit extended discussions. Please indicate your preference for a poster session on the GSA abstract form. Poster displays will consist of one 4'x8' hard surface.

FIELD TRIPS

Contact the field trip leaders listed below for details about particular excursions. For general questions, contact Christopher Abate, field trip coordinator, (843) 953-1802, abatec@cofc.edu. For full descriptions of all trips, see the Web site addresses at the beginning of this announcement.

Premeeting

1. Neotectonic Features of the Lower Coastal Plain of Georgia and South Carolina. Jerry Bartholomew, University

of South Carolina, Columbia, (803) 777-7693, jbarth@esri.esri.sc.edu; Fredrick Rich, Georgia Southern University, Statesboro, (912) 681-0849, frich@gsaix2.cc.gasou.edu. Fractures in exposures of Neogene and Quaternary sediments and the criteria used to determine which fractures might be tectonic in origin versus those that are nontectonic in origin. Orientation of fractures of tectonic origin compared to present-day regional stress field. March 22; cost \$30, includes field guide and box lunch. Minimum 5, maximum 25.

2. Folly Beach, South Carolina: Tomorrow's Coastal Problems, Today. Gered Lennon, College of Charleston (South Carolina), (843) 953-3193, lennong@cofc.edu. Features of a developed barrier island showing an erosional shoreline, including barrier island geomorphology and the history of erosion in context with commercial and residential development. What works and what doesn't work in coastal management practices on a South Carolina barrier island. March 22, cost \$15, includes field guide. Minimum 5, maximum 25.

3. U.S. Geological Survey Aquifer Storage Recovery Project, Charleston, South Carolina. Bruce Campbell, U.S. Geological Survey, Columbia, South Carolina, (803) 750-6100, bcampbel@usgs.gov. The USGS in cooperation with the Charleston Commissioners of Public Works (CCPW) is studying the hydraulic and geochemical effects of long-term storage (years to decades) of treated surface water in the Santee Limestone–Black Mingo aquifer beneath the Charleston peninsula. Aquifer storage recovery (ASR) could provide a means to meet short-term water needs for fire-fighting and potable supply. March 22, afternoon; free and includes handout. Walking tour.

Postmeeting

4. Macroscopic Effects of the 1886 Charleston Earthquake. Pradeep Talwani, University of South Carolina, (803) 777-6449, talwani@prithvi.seis.sc.edu. Macroscopic effects of the 1886 earthquake at an Episcopal church, at Fort Dorchester, and at Magnolia Gardens, illustrating the complex nature of 1886 earthquakes, uplift, and lateral displacement on the Ashley River and Woodstock faults. Incised Ashley River, which has a broad flood plain near Magnolia Gardens, provides geomorphic evidence of uplift. March 25, 8 a.m.–2 p.m.; cost \$35, includes field guide. Minimum 15, maximum 30.

5. Charleston Earthquake Damage Walking Tour. *Sponsored by NAGT Southeastern Section and GSA Southeastern Section Education Committee.* William A. Smith and Marian M. Smith, Charleston [South Carolina] Southern University,

Southeastern continued on p. 20

Southeastern *continued from p. 19*

(843) 863-8085, wsmith@csuniv.edu. From the late 17th century onward, much of Charleston has been built on low-lying marsh land, subsequently filled to produce "made land." On August 31, 1886, a large earthquake (M~7.3) caused significant damage to many buildings. Many pre-colonial and colonial era buildings, some of which are preserved today. The walking tour will proceed through College of Charleston campus and continue through the historic area toward the Battery, ending in the Market area. March 25; cost \$10, includes field guide. Minimum 5, maximum 20.

6. Newberry, South Carolina Eclogite: Structural Setting and Style of Occurrence. Allen J. Dennis, University of South Carolina, Aiken, (803) 641-3396, dennis@sc.edu; John Shervais and Don Secor, University of South Carolina-Columbia. Retrogressed mafic eclogite boudins are mapped within a (retrogressed) amphibolite facies structural block dominated by the ca. 415 Ma (Rb-Sr w.r.) Newberry granite. Mineral, chemical, and petrographic studies document an eclogite → granulite → amphibolite *P-T-t* path for eclogite boudins. Field evidence for a pre-415 Ma collisional event involving the Carolina terrane and current constraints on timing of this event. March 25, cost \$50, includes field guide and lunch. Minimum 10, maximum 22.

7. Depositional History and Coastal Processes at Cape Romain, South Carolina. Walter J. (Jerry) Sexton, Athena Technologies, Inc., Columbia, South Carolina, (803) 790-4483, athena@netside.com; Tim Kana, CSE/Baird, Columbia, South Carolina, (803) 799-8949, tkkana@aol.com. Transgressive and regressive barrier island shorelines. Much of Cape Romain is transgressive with shorelines, back-barrier salt marshes, tidal creeks, Cape Romain Bay, coarse-grain sand beaches, active carbonate depositional settings (oyster beaches and mounds), and a relic flood tidal delta deposit. Shallow cores will be taken and trenches dug. Coastal processes and depositional history of Cape Romain since the late Pleistocene. March 25; onboard a research vessel; cost \$125, includes boat rental, field guide, and box lunch. Minimum 12, maximum 25.

8. Paleontology and Biostratigraphy of the Coastal Plain. David Campbell, University of North Carolina, Chapel Hill, (919) 966-4516, bivalve@mailserv0.iris.unc.edu. Quarries in the South Carolina coastal plain, Cenozoic outcrops, including Santee Limestone, Cross Formation, Goose Creek Limestone, and Raysor Formation, which have mollusks, echinoderms, bryozoans, vertebrates, microfossils, and other fossils. March 25; cost \$25, includes field guide and box lunch. Minimum 8, maximum 30.

STUDENT RESEARCH PROGRAMS

Sigma Gamma Epsilon will sponsor an oral and/or poster theme session, "Innovative Applications of GIS Technology to Geological Research," which will focus on student research. The Council for Undergraduate Research will sponsor a student poster session to showcase senior theses and other undergraduate research projects. First authors must be undergraduate students and responsible for the bulk of the research, preparation of posters, and presentation of results. For more information, contact Brannon Andersen, (864) 294-3366, brannon.andersen@furman.edu. Travel stipends for students enrolled in schools within the GSA Southeastern Section are available. See www.geo.ua.edu/segsa for more information. The deadline for student travel applications is March 1, 2000.

SHORT COURSE: INTRODUCTION TO SEQUENCE STRATIGRAPHY

Sponsored by Exxon. Presenter: Art Donovan, Exxon Production Research Company. Introduction for graduate and upper-level undergraduate students and faculty to the basics of sequence stratigraphy. For more information or to register, contact Art Donovan, Art.D.Donovan@exxon.sprint.com. The course will illustrate the differences between sequence stratigraphy and traditional lithostratigraphy, as well as T-R, R-T, and allostratigraphic analysis. Most importantly, it will provide delegates with "hands-on" experience in siliciclastic sequence-stratigraphic analysis using outcrop, core, well-log, and seismic data. March 24 and March 25; no cost.

WORKSHOP—EXPLORING PLATE TECTONICS: A HANDS-ON APPROACH

Sponsored by Lowcountry Hall of Science, and College of Charleston Department of Geology. For geoscience educators. Preregister before February 11, 2000. March 24; \$15, includes lunch. Contact Leslie Sautter, (843) 953-5586 or (843) 953-7847, sautter@cofc.edu, for more information.

CEU (CONTINUING EDUCATION UNIT) CREDITS

The South Carolina Board of Registration for Geologists has approved attendance at SEGSA 2000 technical sessions and field trips for Continuing Education Unit (CEU) credits. Amount varies depending on participation. If you are a professional geologist or geologist-in-training in South Carolina, or if your state has a reciprocal agreement with South Carolina, send your registration number to June Mirecki, and she will provide documentation to the board. For more information, contact June Mirecki, (843) 953-8278, mireckij@cofc.edu.

EXHIBITOR CONTACT AND INFORMATION

Tables for commercial, academic, and government exhibitors will be available. Contact Bob Nusbaum, (843) 953-5596, nusbaumr@cofc.edu, for more information.

BUSINESS MEETINGS

GSA Southeastern Section Education Committee-NAGT Southeastern Section Business Meeting. March 24, 6:30 a.m., breakfast buffet, Holiday Inn-Historic District, 125 Calhoun St., \$6.95 plus tax and gratuity. John E. Callahan, Appalachian State University, (828) 262-2746, callahnje@appstate.edu. GSA Southeastern Section Campus Liaison Breakfast. March 23, 6:30-8:30 a.m., Westin Francis Marion Hotel. Steve Lenhart, Radford University, slenhart@runet.edu. GSA Southeastern Section Geology and Public Policy Committee. March 23, lunch. John Kiefer, Kentucky Geological Survey, kiefer@kgs.mm.uky.edu. GSA Southeastern Section Student Support Committee Meeting. GSA Southeastern Section Business Meeting. March 22, 4:30-6:30 p.m. GSA Southeastern Section Management Board Meeting. March 22, 4:30-6 p.m. GSA Second Century Fund Meeting. GSA Southeastern Section Ph.D.-Granting Earth Science Chairs Breakfast. March 24, 7-8 a.m.

GUEST PROGRAM

Contact Kem Fronabarger, College of Charleston, (843) 953-5509, fronabarger@cofc.edu, for more information. See pre-registration form for prices.

1. Horse-drawn Carriage Tours of Charleston. March 23, 24. Max. 20.
2. Walking "Pirate's Tour" of Charleston. March 23, 24. Max. 20.
3. Garden Walking Tour of Charleston. March 23, 24. Max. 20.
4. Ghost Walking Tour of Charleston. March 23, 24. Max. 20.
5. Fort Sumter National Monument in Charleston Harbor. March 24.

OTHER SITES OF INTEREST

See www.geosociety.org/profdev/sectdiv/00semtg.htm for a list of area museums, historic buildings, and other attractions.

DETAILED INFORMATION

Visit the Web sites whose URLs are given at the beginning of this announcement. For a paper copy of the full meeting announcement, call GSA at (303) 447-2020, ext. 239. ■

PREREGISTRATION FORM

GSA Southeastern Section

Charleston, South Carolina
March 22-24, 2000

Preregistration Deadline: February 11, 2000
Cancellation Deadline: February 18, 2000

Register one professional or student per form.
Copy form for your records.

Please print clearly • THIS AREA IS FOR YOUR BADGE

First Name _____ Last Name _____
 Employer/University Affiliation _____
 City _____ State or Country _____

Mailing Address (use two lines if necessary) _____

 City _____ State _____
 ZIP Code _____ Country (if other than USA) _____
 () _____ Business Phone _____ Male Female
 () _____ Fax _____
 () _____ Home Phone _____
 E-mail _____

GUEST INFORMATION • Please print clearly • This area is for badge

First Name _____ Last Name _____ Male Female
 City _____ State or Country _____

MAIL TO:
GSA SOUTHEASTERN SECTION MEETING, P.O. BOX 9140, BOULDER, CO 80301

OR
FAX TO: 303-443-1510 or 303-447-1133
Remit in U.S. funds payable to: 2000 GSA Southeastern Section Meeting
(All preregistrations must be prepaid. Purchase Orders not accepted.)

Payment by (check one): Check # _____ American Express
 VISA MasterCard Discover Diners Club

Card Number _____
 Signature _____ Expires _____

PREREGISTRATION FEES

	Full Meeting	One Day	Qty.	Amount
Professional Member*	(10) \$75 <input type="checkbox"/>	(11) \$50 <input type="checkbox"/>	_____	\$ _____
Professional Member (70 & older)*	(12) \$25 <input type="checkbox"/>	(13) \$20 <input type="checkbox"/>	_____	\$ _____
Professional Nonmember	(14) \$85 <input type="checkbox"/>	(15) \$50 <input type="checkbox"/>	_____	\$ _____
Student Member*	(30) \$35 <input type="checkbox"/>	(31) \$20 <input type="checkbox"/>	_____	\$ _____
Student Nonmember	(32) \$40 <input type="checkbox"/>	(33) \$20 <input type="checkbox"/>	_____	\$ _____
K-12 Professional	(60) \$30 <input type="checkbox"/>	_____	_____	\$ _____
Guest or Spouse	(90) \$25 <input type="checkbox"/>	_____	_____	\$ _____
Field Trip Only	(95) \$ 5 <input type="checkbox"/>	_____	_____	\$ _____

*Member fee applies to any current Professional OR Student Member of GSA or Associated Societies listed below.
 Check member affiliation (to qualify for member registration discount):
 (1) GSA (member # _____) (2) AWG (3) CUR (4) NAGT (5) PS (6) SEPM
 Discount does not apply to guest registrants.

WORKSHOP

1. Exploring Plate Tectonics March 24 (601) \$ 15 1 \$ _____

FIELD TRIPS (Separate registration forms required for each field trip participant.)

- Neotectonic Features of Georgia-South Carolina March 22 (401) \$ 30 1 \$ _____
- Folly Beach S.C. Coastal Problems March 22 (402) \$ 15 1 \$ _____
- U.S. Geological Survey ASR Project March 22 (403) N/C 1 \$ _____
- Macroscopic Effects of the 1886 Charleston Earthquake March 25 (404) \$ 35 1 \$ _____
- Charleston Earthquake Damage Walking Tour March 25 (405) \$ 10 1 \$ _____
- Newberry, SC Ecogite March 25 (406) \$ 50 1 \$ _____
- Coastal Processes at Cape Roman March 25 (407) \$125 1 \$ _____
- Paleontology and Biostratigraphy Coastal Plain March 25 (408) \$ 25 1 \$ _____

GUEST PROGRAM

- Horse-drawn Carriage Tour March 23 (101) \$ 16 _____
 March 24 (102) \$ 16 _____
- Walking "Pirates" Tour March 23 (103) \$ 16 _____
 March 24 (104) \$ 16 _____
- Garden Walking Tour March 23 (105) \$ 22 _____
 March 24 (106) \$ 22 _____
- Ghost Walking Tour March 23 (107) \$ 13 _____
 March 24 (108) \$ 13 _____
- Fort Sumter National Monument March 24 (109) \$ 15 _____

TOTAL FEES \$ _____

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 Please inform us by February 11 of any special considerations that you or your guest require.
 I will need special considerations.

SOUTH-CENTRAL SECTION, GSA 34th Annual Meeting

Fayetteville, Arkansas

April 3-4, 2000

www.geosociety.org/profdev/sectdiv/southc/00Sscmtg.htm

Hosted by the Department of Geosciences of the University of Arkansas at Fayetteville in conjunction with the Arkansas Water Resource Center, the Department of Earth Sciences of the University of Arkansas at Little Rock, the Department of Physical Sciences and Geology of Arkansas Tech University, the Arkansas Geological Commission, and the Fort Smith Geological Society, Sunday, April 2, through Wednesday, April 4, at the Center for Continuing Education in Fayetteville, Arkansas, in association with the Pander Society, the South-Central Section of the Paleontological Society, the Midcontinent Section of the Society for Sedimentary Geology and the Midcontinent Section of the National Association of Geoscience Teachers.

Location

Fayetteville is in the Ozark Region of Northwest Arkansas and is on the boundary between the Springfield Plateau to the north and the Boston Mountains to the south. U.S. Highways 540, 71, and 412 provide convenient access from the south, north, and west. A new regional airport is about 26 miles northwest of Fayetteville. The Fayetteville Hilton is attached to the Center for Continuing Education.

Technical Program

Please bring your own loaded carousel trays. There will be two projectors for each oral session, and overhead projectors will be available.

Symposia

1. Alkalic Rocks of North America. Don F. Parker, Baylor University, donparker@baylor.edu; Daniel S. Barker, University of Texas, Austin, danbarker@mail.utexas.edu; J. Michael Howard, Arkansas Geological Commission, Little Rock, Mike.Howard@mail.state.ar.us.
2. Advances in Structural Geology. John M. Spang, Texas A & M University, J.Spang@tamu.edu; Jeffery Connelly, University of Arkansas at Little Rock, jbconnelly@ualr.edu.
3. Atokan Series: A Centennial Re-examination. *Sponsored by the Paleontological Society, South-Central Section.* Walter L. Manger, University of Arkansas, Fayetteville, wmanger@comp.uark.edu.
4. Hydrogeology of Mantled Karst. Van Brahana, University of Arkansas, Fayetteville, jbrahana@jungle.uark.edu.
5. General Hydrogeology. Ralph K. Davis, University of Arkansas, Fayetteville, ralphd@comp.uark.edu.
6. Environmental Hydrology: Annual Research Conference. *Sponsored by Arkansas Water Resource Center.* Kenneth F. Steele, Arkansas Water

Resource Center, University of Arkansas, Fayetteville, ksteele@comp.uark.edu.

7. Geological and Geochemical Studies in Southern Lakes. Stephen K. Boss, University of Arkansas, Fayetteville, sboss@comp.uark.edu.

8. Pander Society Symposium. James Barrick, Texas Tech University, ghjeb@ttu.edu.

Field Trips

Except for the premeeting trip in west Texas and the postmeeting trip in central Arkansas, all field trips will depart from and return to the Hilton Hotel. Contact field trip leaders for more information. For full descriptions of trips, use Web address above. All field trip participants must register for the meeting.

Premeeting

1. Peralkalic Rhyolite of the Davis Mountains and Big Bend Areas, Texas. Don F. Parker, Baylor University, don_parker@baylor.edu; Daniel S. Barker, University of Texas, Austin, danbarker@mail.utexas.edu; John C. White, and Greg S. Holt. Begins and ends at the El Paso airport. Pantelleritic Gomez Tuff and Adobe Canyon Rhyolite. Eruptive units of Big Bend National Park. March 31-April 2, \$200; includes transportation, two motel nights, and lunches.
2. Geomorphology, Hydrology, and Environmental Issues in a Mantled Karst Terrain. Van Brahana, University of Arkansas, Fayetteville, jbrahana@jungle.uark.edu. Springfield Plateau of the Ozarks, underlain by carbonate rocks that develop ground-water flow conduits, caves and springs, but few other surface karst features. Goals of trip: (1) to demonstrate the range of karst geomorphic features present beneath the mantle of regolith, (2) to illustrate sampling infrastructure in a long-term research watershed, and (3) to summarize the benefits and challenges of

interdisciplinary study in a diverse suite of near-surface environments. April 2, includes lunch and guidebook. Professionals \$35; students \$28.

3. Sequence Stratigraphy of the Atokan Series, Northwest Arkansas. Sponsored by the Society of Sedimentary Geology. Walter L. Manger, University of Arkansas, Fayetteville, wmanger@comp.uark.edu. New road cuts expose a virtually complete section of the Atoka Formation as expressed in the Boston Mountains, northern Arkansas. Emphasis on facies cyclicity of sequences within this single Vail third-order cycle. Comparison of surface expression of the sandstone intervals with natural gas reservoirs developed in the same units in the Arkoma basin. April 2, includes lunch, guidebook and pretrip meeting April 1, evening. \$50.

4. Carboniferous Fossil Localities of Northwestern Arkansas. Lynne Hehr, lhehr@comp.uark.edu; and Doy Zachry, dzachry@comp.uark.edu. University of Arkansas, Fayetteville. Fossil localities in rocks of late Mississippian and Early Pennsylvanian age in northwest Arkansas. Collecting will be permitted. Designed for K-12 teachers. April 1, \$15, includes lunch and guidebook. Maximum 25, minimum 10.

Postmeeting

5. Alkalic Rocks of Central Arkansas. J. Michael Howard, Arkansas Geological Commission, Little Rock, Mike.Howard@mail.state.ar.us. Departs from and return to the Select Holiday Inn, Shackelford Road, Little Rock, Arkansas. Classic localities, including a pulaskite quarry near Little Rock, Saline County nepheline syenite and the Magnet Cove and Potash Sulfur Springs intrusive complexes. Departs from and returns to the Select Holiday Inn, Shackelford Road, Little Rock, Arkansas. Make reservations for the Select Holiday Inn by calling 1-800-465-4329, or for an adjacent La Quinta Inn, 1-800-687-6667. April 5, \$50, includes lunch and guidebook. Limit 25.

Student Poster Sessions

Undergraduate Research Poster Session. *Sponsored by the Geology Division of the Council on Undergraduate Research.* Showcases senior theses and other undergraduate research projects; a student must be listed as the lead author and be the major preparer of the poster. Diane Smith, Trinity University, (210) 999-7656, fax 210-999-8264, dsmith@trinity.edu. Graduate Student Sedimentary Geology Poster Session. *Sponsored by the Society for Sedimentary Geology.* Features research in sedimentology and related areas by graduate students. The student must be the sole author of the work. John Holbrook, Southeastern Missouri State University, Cape Girardeau, jholbrook@semovm.semo.edu.

Student Paper Awards and Travel Grants

Awards will be presented for the best oral student paper and best student poster at the meeting. Awards will be based on quality of research and effectiveness of presentation. To be eligible, the abstract must list only student authors and must be identified clearly as a student paper. The GSA South-Central Section will award travel grants to GSA student members who give papers (oral or poster) of which he or she is the presenter and author or co-author at the meeting. To be eligible for travel assistance grants, students must be currently enrolled in an academic department in the South-Central Section and certify their student membership in GSA. Obtain an application for travel from Doy Zachry, University of Arkansas, Fayetteville, (501) 575-2785, fax (501) 575-3177, dzachry@comp.uark.edu. Applications must be received by January 14, 2000.

Workshop

Roy J. Shlemon Mentor Program in Applied Geology. For graduate and advanced undergraduate students, an interactive workshop dealing with "real life" issues about professional opportunities and challenges beyond graduation. No cost. April 3. Maximum 30; minimum 10. Preregistration required.

Short Course

Hydrogeology and Geochemistry of Salt Water Contamination. *Sponsored by the Arkansas Water Resource Center.* Charles Kreitler, a principal with Leggette, Brashear and Graham and manager of LBG-Guyton Associates in Austin, Texas.

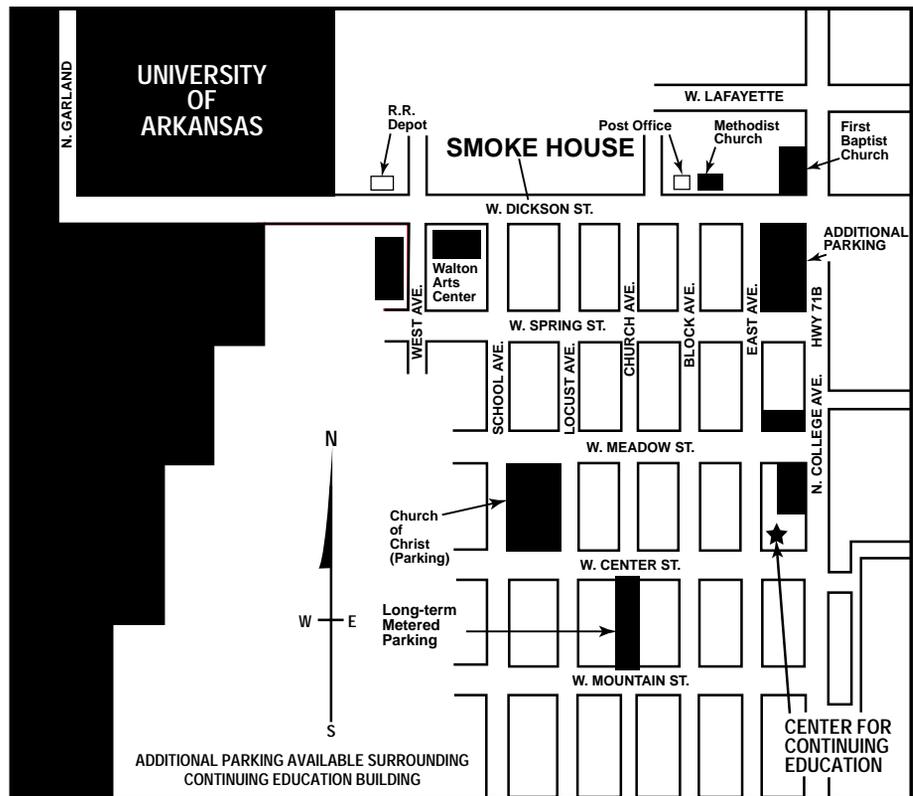
Review of settings in which salt-water contamination may occur and discussion of integrated approach to its detection. Emphasis on impact from oil and gas activities. April 5. Contact Kenneth F. Steele, Arkansas Water Resource Center, University of Arkansas, Fayetteville, (501) 575-4403, ksteele@comp.uark.edu.

Out of the Rocks: Bringing Fossils to Life, NAGT Workshop

For K-12 teachers and other interested persons, 2-4 p.m. on the University of Arkansas campus. Participants may bring fossils for examination and reconstruction. Teachers who participate in field trips can bring specimens collected during the trip. Lynne Hehr, Center for Math and Science Education, lhehr@comp.uark.edu; Kent Nielsen, University of Texas at Dallas, knielsen@utdallas.edu; and Doy Zachry, University of Arkansas, Fayetteville.

Exhibits

Facilities for business, government, and educational exhibitors will be available in the Continuing Education Center.



Space rental is \$125 for commercial, which will include one complimentary registration, and \$50 for educational. For more information, contact Stephen Boss, University of Arkansas, Fayetteville, (501) 575-7134, fax 501-575-3177, sboss@comp.uark.edu.

Registration

Preregistration deadline:
February 18, 2000

Preregister to qualify for lower registration fees. Field trip participants must preregister for the meeting. Use the preregistration form in this announcement or on the GSA Web page. Full payment MUST accompany the preregistration form.

Guest registration is required for those attending guest activities, technical sessions, or the exhibit hall. Guest registrants (nongeologist spouse or friend) must be accompanied by either a registered professional or student. Students and K-12 teachers must show a current ID in order to obtain reduced rates. If you preregister, your badge will be mailed to you two weeks prior to the meeting. All registrations received after February 18 will be held for on-site processing and charged the on-site rates.

All requests for registration additions, changes, and cancellations must be made in writing and received by February 25, 2000. There will be no refunds for cancellations received after this date.

On-Site Registration

Sequoyah Room Hilton Hotel	Sunday, April 2 4-8 p.m.
Continuing Education Center	Monday, April 3 8 a.m.-4 p.m.
Continuing Education Center	Tuesday, April 4 8 a.m.-4 p.m.
Continuing Education Center	Wednesday, April 5 8 a.m.-12 p.m.

Housing

The Hilton Hotel, adjacent to the Center for Continuing Education, is offering a special room rate of \$75 for single through quad occupancy. Parking in the adjacent Hilton parking deck is free. Make your reservations directly with the hotel by February 25, 2000. If calling, ask for the South-Central Section, Geological Society of America, block; call (501) 442-5555, or fax 501-442-2105. The Hampton Inn, (501) 587-8300, the Park Inn, Ltd., (501) 575-0777, and the Quality Inn, (501) 444-9800 are nearby motels.

Business Meetings and Social Events

Management Board Meeting and Business Meeting. The South-Central Section Management Board Meeting will be held at 5:00 p.m. in the Sequoyah Room of the Hilton Hotel. The South-Central Section Business Meeting will be held at 4:00 p.m. in the Center for Continuing Education.

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PREREGISTRATION FORM

GSA South-Central Section

Fayetteville, Arkansas
April 3-4, 2000

Preregistration Deadline: February 18, 2000
Cancellation Deadline: February 25, 2000

Please print clearly • THIS AREA IS FOR YOUR BADGE

First Name _____ Last Name _____
 Employer/University Affiliation _____
 City _____ State or Country _____

Mailing Address (use two lines if necessary) _____

City _____ State _____

ZIP Code _____ Country (if other than USA) _____

() _____ Business Phone _____ Male Female

() _____ Fax _____

() _____ Home Phone _____

E-mail _____

GUEST INFORMATION • Please print clearly • This area is for badge

First Name _____ Last Name _____ Male Female
 City _____ State or Country _____

MAIL TO:
GSA SOUTH-CENTRAL SECTION MEETING, P.O. BOX 9140, BOULDER, CO 80301
OR

FAX TO: 303-443-1510 or 303-447-1133
Remit in U.S. funds payable to: 2000 GSA South-Central Section Meeting
(All preregistrations must be prepaid. Purchase Orders not accepted.)

Payment by (check one): Check # _____ American Express
 VISA MasterCard Discover Diners Club

Card Number _____

Signature _____ Expires _____

Register one professional or student per form.
 Copy form for your records.

REGISTRATION FEES	Full Meeting	One Day	Qty.	Amount
Professional Member*	(10) \$70 <input type="checkbox"/>	(11) \$50 <input type="checkbox"/>	_____	\$ _____
Professional Member (70 & older)*	(12) \$25 <input type="checkbox"/>	(13) \$20 <input type="checkbox"/>	_____	\$ _____
Professional Nonmember	(14) \$75 <input type="checkbox"/>	(15) \$50 <input type="checkbox"/>	_____	\$ _____
Student Member*	(30) \$30 <input type="checkbox"/>	(31) \$25 <input type="checkbox"/>	_____	\$ _____
Student Nonmember	(32) \$35 <input type="checkbox"/>	(33) \$30 <input type="checkbox"/>	_____	\$ _____
K-12 Professional	(60) \$20 <input type="checkbox"/>	_____	_____	\$ _____
Guest or Spouse	(90) \$20 <input type="checkbox"/>	_____	_____	\$ _____
Field Trip Only	(95) \$ 5 <input type="checkbox"/>	_____	_____	\$ _____

*Member fee applies to any current Professional OR Student Member of GSA or Associated Societies listed below.
 (1) GSA (member # _____)
 (2) AWG (3) AWRC (4) GIS (5) NAGT (6) SEG (7) SGE (8) SEPM
 Discount does not apply to guest registrants.

TICKETED EVENT

Meeting Dinner and Social April 3 (301) \$10 _____ \$ _____

WORKSHOP

Shlemon Mentor Program (Students) April 3 (601) N/C _____ \$ _____

FIELD TRIPS (Separate registration forms required for each field trip participant.)

- Peralkalic Rhyolite of the Davis Mountains and Big Bend Areas March 31-April 2 (401) \$200 1 \$ _____
 Watershed
 Professional (402) \$35 1 \$ _____
 Student (403) \$28 1 \$ _____
- Hydrogeology of the Savoy Experimental April 2
 Professional (404) \$50 1 \$ _____
 Student (405) \$15 1 \$ _____
- Sequence Stratigraphy of the Atokan Series April 1
 Professional (406) \$50 1 \$ _____
 Student (407) \$15 1 \$ _____
- Carboniferous Fossil Localities of NW Arkansas April 1
 Professional (408) \$50 1 \$ _____
 Student (409) \$15 1 \$ _____
- Alkalic Rocks of Central Arkansas April 5
 Professional (410) \$50 1 \$ _____
 Student (411) \$15 1 \$ _____

FOR OFFICE USE

A/R	DR	CR
Refund	_____	_____
Refund ck#	_____	_____

TOTAL FEES \$ _____



Please inform us by February 18 of any special considerations that you or your guest require.

I will need special considerations.

South-Central *continued from p. 23*

Welcoming Party. Sunday, April 2, Sequoyah Room, Hilton Hotel. Meeting Dinner and Social. Monday, April 3, Smoke House. Join friends and colleagues at the Smoke House on Dickson Street four blocks from the Hilton (see map). Purchase tickets in advance. \$10. Departmental Heads and Chairs Luncheon Meeting. Monday, April 3, 12 noon. For further information, contact Doy Zachry, University of Arkansas, Fayetteville, (501) 575-2785, fax 501-575-3177, dzachry@comp.uark.edu.

Further Information

Go to www.geosociety.org/profdev/sectdiv/southc/00scmtg.htm for the complete final announcement. Obtain a paper copy by calling (303) 447-2020, ext. 239 or by writing to GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140. ■

STUDENTS!!

Don't Miss a Free Meal

And an opportunity to explore the world of applied geoscience! Attend the Roy J. Shlemon GeoMentor Program at your Section's meeting; have some munchies and get down to business, talking with the "movers and shakers." This is your chance to find out from those who know what it takes to get a job after graduation. No cost to students; preregistration is required. Hurry! Maximum attendance is 30.

HOUSING FORM — Hilton Hotel, Fayetteville, Arkansas

South-Central Section, Geological Society of America
Sunday, April 2–Wednesday, April 5, 2000

Arrival Date _____ Departure Date _____

PERSON REQUESTING HOUSING (type or print)

Last Name _____ First _____

Institution or Firm _____

Address or P.O. Box _____

City _____ State/Province _____ ZIP Code _____

Phone: () _____ () _____
Work Home

Place reservation in name of: _____

Name of all other occupants:

RATES PER ROOM*

Single–Quad Occupancy—\$75

SPECIAL NEEDS Smoking Room Nonsmoking Room Special Room

Special Room Requirements _____

*Enclose check or money order (for amount of one night's lodging) payable to Hyatt Regency New Brunswick or major credit card number and date of expiration. No cancellations accepted within 48 hours of arrival.

Reservations must be made by February 25, 2000.

Telephone reservations accepted: (501) 442-5555; fax 501-442-2105.

Type of Card _____ Card Number _____

Name as it appears on the credit card _____

Exp. Date _____ Signature _____

SEND THIS FORM AND REMITTANCE OR CREDIT CARD INFORMATION TO:
Hilton Hotel, 70 N. East Street, Fayetteville, AR 72701.

Toward A Stewardship of the Global Commons

Engaging “My Neighbor” in the Issue of Sustainability

The earth sciences, broadly defined, will provide important understandings for society in the 21st century. As the global human population approaches and perhaps exceeds 9 billion people, interactions among the atmosphere, biosphere, hydrosphere and lithosphere will define significant boundary conditions for the future sustainability of the human enterprise and the survival of these Global Commons. During the first year of the new millennium, the Critical Issues Committee of GSA will explore the stewardship of the Global Commons in a 12-part interrelated series of essays that will provide pathways to bring the issue of sustainability into the public domain. The essays will be permanently posted on GSA's Web site at www.geosociety.org/criticalissues, linked internally to the GSA pages on Education and on Guidelines to Sustainability Literacy, and externally

to the international net of sites engaged in the many facets of sustainability.

Watch for them. Check the GSA Web site. Engage your students or neighbors in dialogues about the ideas that will influence the quality of their lives and those of their children or grandchildren in the coming decades.

The planned essays are: Part I, Stewardship of the Commons; Part II, The Context of Humanity; Part III, Doubling Time; Part IV, Renewable vs. Nonrenewable Resources; Part V, Earth Systems; Part VI, Ecological Footprints and Carrying Capacity; Part VII, Spaceship Earth; Part VIII, We Are a Part of, Not Apart from, the Global Ecosystem; Part IX, We Live in a Universe of Change; Part X, What Do We Mean by a “Sustainable Society?”; Part XI, Social Justice and Equity; Part XII, We Have the Option of Choice.

GSA Critical Issues Committee

Call for Applications and Nominations for GSA *Bulletin* Editor

The GSA *Bulletin* seeks a co-editor, beginning January 1, 2001. The new editor will replace the editor whose term ends in 2000 and will serve a four-year term. A phased transition should begin in the summer of 2000.

The GSA *Bulletin* has a 112-year history of excellence in publication of definitive works related to all aspects of geoscience. Part of GSA's mission is to bring together different earth sciences in a forum for scientific inquiry and discussion, and the *Bulletin* editors will be charged with continuing this tradition while helping Society staff find the best ways to provide comprehensive manuscripts in the electronic environment.

Editor Duties

1. Continue to maintain excellence of journal content through active solicitation of diverse and definitive manuscripts.
2. Ensure stringent peer review and expeditious processing of manuscripts.
3. Make final acceptance or rejection decisions after consideration of recommendations of reviewers and Associate Editors.
4. Correspond with authors regarding revisions and expeditious return of final manuscripts. Maintain active correspondence with current and potential contributors.
5. Select contents for each issue that will interest the broadest audience possible.
6. Select and maintain an active board of Associate Editors.
7. Report to the Committee on Publications on manuscript topic trends and issues specific to the *Bulletin*.

Editor Qualities

1. Broad personal background and active research in the geological sciences. Broad knowledge of geological research activities of scientists both nationally and internationally.
2. Interest in electronic publishing and in maximizing *Bulletin* content for print and electronic media.

3. Willingness to try new techniques to enhance author and reader satisfaction (e.g., theme issues).
4. Excellent organizational skills and ability to manage significant manuscript flow to ensure timely publication of papers. Ability to supervise editorial assistant to ensure that schedules are maintained.
5. Ability to remain tactful and helpful to authors, yet create and maintain stringent acceptance and rejection policies.
6. Willingness and capability to coordinate working schedules with a co-editor.
7. Willingness to invest about one day per week on *Bulletin*-related activities.
8. Objectivity and scientific maturity.

If you are interested in this opportunity to help guide the *Bulletin*, one of the premier geoscience journals, submit a resume and a brief letter describing relevant qualifications, experience, and objectives. If you are nominating someone, include a letter of nomination and the nominee's written permission and resume. Send nominations and applications to Peggy S. Lehr, Chief Operating Officer/Director of Publications, Geological Society of America, P.O. Box 9140, Boulder, CO 80301 by May 15, 2000. ■

2000 GSA SECTION MEETINGS

NORTHEASTERN SECTION

March 13-15, 2000
Hyatt Regency Hotel,
New Brunswick, New Jersey

Abstract Deadline:

November 29, 1999

Submit completed abstracts to: Kenneth G. Miller, Dept. of Geological Sciences, Wright Lab, Rutgers University, 610 Taylor Rd., Piscataway, NJ 08854-8066, (732) 445-3622, kgm@rci.rutgers.edu

SOUTHEASTERN SECTION

March 23-24, 2000
Westin Francis Marion Hotel,
Charleston, South Carolina

Abstract Deadline:

December 8, 1999

Submit completed abstracts to: June E. Mirecki, Dept. of Geology, College of Charleston, Charleston, SC 29424-0001, (803) 953-8278, mireckij@cofc.edu

SOUTH-CENTRAL SECTION

April 3-4, 2000
Center for Continuing
Education, Fayetteville,
Arkansas

Abstract Deadline:

December 8, 1999

Submit completed abstracts to: John Van Brahana, Dept. of Geology, University of Arkansas, Ozark Hall 118, Fayetteville, AR 72701-1201, (501) 575-2570, jbrahana@jungle.uark.edu

NORTH-CENTRAL SECTION

April 6-7, 2000
Indiana State Government
Center, Indianapolis, Indiana

Abstract Deadline:

December 20, 1999

Submit completed abstracts to: Robert D. Hall, Dept. of Geology, Indiana University-Purdue University, 723 W Michigan St., Indianapolis, IN 46202-5132, (317) 274-7484, rhall@iupui.edu

ROCKY MOUNTAIN SECTION

April 17-18, 2000
Missoula Community Theater,
Missoula, Montana

Abstract Deadline:

January 15, 2000

Submit completed abstracts to: Marc Hendrix, Dept. of Geology, University of Montana, Missoula, MT 59812-1019, (406) 243-5278, marc@selway.umt.edu

CORDILLERAN SECTION

April 27-29, 2000
Robson Square Conference
Centre, Vancouver, British
Columbia

Abstract Deadline:

January 10, 2000

Submit completed abstracts to: Peter Mustard, Dept. of Earth Sciences, Simon Fraser University, Burnaby, BC V5A 1S5, Canada, (604) 291-5389, pmustard@sfu.ca



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GEOLOGICAL SOCIETY OF AMERICA

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**SEDIMENTARY GEOLOGIST
THE UNIVERSITY OF AKRON**

The Department of Geology at The University of Akron invites applications for a tenure-track assistant professor position in the general area of sedimentary geology, starting August 28, 2000. The preferred candidate will have a strong field-orientation with a specialty in carbonate or clastic sedimentary petrography, sedimentology, or stratigraphy. A Ph.D. in geology or a related field is required, and previous teaching/research experience is desirable. A commitment to excellence in both teaching and research is required. Teaching responsibilities will include graduate courses in his/her specialty, sedimentation and stratigraphy, general studies courses, and participation in field camp. An interest in working into the directorship of field camp is desirable. The successful candidate will develop an externally funded research program and supervise graduate student research at the M.S. level. Salary will be commensurate with the candidate's level of experience. Startup funds available. Send letter of application along with a statement of research and teaching interests, complete vita, and names, addresses, phone numbers, and e-mail of 3 referees to: Dr. Annabelle Foos; Dept. of Geology, The University of Akron, Akron, OH 44325-4101. Visit www.uakron.edu/geology for additional information. The University of Akron is an Equal Opportunity/Affirmative Action Employer. Application deadline: January 15, 2000.

**UNIVERSITY OF ALABAMA
DEPARTMENT OF GEOLOGICAL SCIENCES**

The Department of Geological Sciences at the University of Alabama invites applications for a tenure-track faculty position in seismic stratigraphy beginning in August 2000. The position will be filled at either the Associate or Assistant Professor level, depending on qualifications. Candidates should have a strong record of research in acquisition and stratigraphic interpretation of seismic reflection data at any scale. A Ph.D. in geology, geophysics or a related field is required, and postdoctoral or industry experience is preferred. The successful candidate will be expected to develop and teach the undergraduate core course in stratigraphy and sedimentology, teach graduate courses in seismic stratigraphy, attract and supervise master's and doctoral students, and obtain external funding to support his/her research efforts. Applicants are requested to send a vita, statements of research and teaching interests, copies of transcripts, and the names and contact information for three references to: Dr. Dennis Harry, The University of Alabama, Department of Geological Sciences, Box 870338, Tuscaloosa, AL, 35487-0338. The UA Department of Geological Sciences consists of 12 full-time faculty. Departmental information is available on our Web site at www.geo.ua.edu. Applications will be reviewed beginning December 1, 1999. The University of Alabama is an Equal-Opportunity, Affirmative-Action Employer. Applications are solicited from women and minority candidates.

**HYDROGEOLOGY
BATES COLLEGE**

Applications are invited for a tenure-track position at the assistant professor level to begin in September 2000. The primary interest of the individual should be in the broad field of hydrogeology. Other complementary interests could include geochemistry, geophysics, or G.I.S. The successful individual must have a Ph.D., possess a strong commitment to undergraduate education and is expected to develop a program of faculty research involving undergraduates. The position presents a significant opportunity for curricular development and research and for developing interactions with other colleagues in geology as well as the other natural sciences and the environmental studies program. Application should include a letter that discusses teaching and research interests, transcripts of all college course work, and the names, addresses, and phone numbers of three referees from whom letters of recommendation may be solicited. Review of applications will begin January 1, 2000, and will remain open until filled. Application materials should be sent to: Chair, Geology Search Committee, c/o Secretarial Services, Lane Hall, 2 Andrews Road, Bates College, Lewiston, ME 04240. Visit the Bates Web page at www.bates.edu and www.bates.edu/acad/depts/geology. Bates College values a diverse college community and seeks to assure equal opportunity through a continuing and effective Affirmative Action program.

**FACULTY POSITION
CALIFORNIA STATE UNIVERSITY, HAYWARD**

The Department of Geological Sciences at California State University, Hayward, seeks a dynamic faculty member with strengths in applied geophysics, engineering geology or sedimentology. A tenure-track position at the Assistant

Professor level will be offered beginning September 2000, conditional upon availability of funds. The individual hired will be expected to have talents in undergraduate and graduate teaching for a diverse student population, and become part of the research program in geology or environmental science. Expertise in GIS and spatial analysis is highly desirable, as is significant field experience. The department offers BA, BS and MS degrees in geology, and plays a major role in the university's environmental science and teacher credential programs. Applicants who will possess the PhD by September 2000, should mail a curriculum vita, and three letters of recommendation to Dr. Nancy Fegan, Search Committee Chair, Department of Geological Sciences, California State University, Hayward, 25800 Carlos Bee Boulevard, Hayward, CA 94542-3088. Refer to position #00-01 GEOLOGY-TT. Review of applications will begin December 15, 1999, and continue until a suitable candidate is found. California State University is an Equal Opportunity Employer and is committed to principles of diversity in employment and education.

GEOCHEMISTRY

CALIFORNIA STATE UNIVERSITY, LONG BEACH

The Department of Geological Sciences invites applications for a tenure-track position at the Assistant Professor level to begin August 2000. A Ph.D. in geology or earth sciences at time of appointment and a commitment to teaching and research are required. The successful candidate is expected to teach upper-division and graduate courses in geochemistry; to teach introductory geoscience to non-science undergraduates; and to supervise student research. All subfields in geochemistry will be considered. Selection criteria include background in geochemistry; research and teaching interests complementing existing strengths in paleontology, marine geology, sedimentology, or earth system science; experience or potential to teach courses in geochemistry; demonstrated commitment to development of an externally funded research program involving students that will lead to scientific publication and presentation; and an ability to communicate effectively with

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**CROSSING DIVIDES:
Congressional Science Fellowship
2000-2001**

Be the first GSA Congressional Science Fellow of the new millennium! Put your expertise and experience to work helping shape science and technology policy on Capitol Hill. Work directly with national and international leaders.

The millennial Congressional Science Fellow will be selected from among top competitors early in 2000. If you are an experienced earth scientist with a broad geologic background, experience in applying scientific knowledge to societal challenges, and a passion for helping shape the future of the geoscience profession, GSA invites your application.

What Does a Fellow Do?

Fellows typically perform tasks normally asked of permanent congressional staff and respond to any situation or legislation that pertains to science.

Who Benefits from the Fellowship?

Both the scientific and legislative communities are served. Fellows offer their scientific expertise to Congress, and they gain insight into the legislative process—specifically how science does or does not influence public policy. Nearly one-third of all Congressional Science Fellows have pursued careers in public policy after completing fellowships. To learn more about the fellow experience, contact David Verardo, 1997-1998 GSA Congressional Science Fellow, at (202) 314-2234 or dverardo@usgcrp.gov.

How To Apply

Submit a letter of intent, a curriculum vitae, and three letters of recommendation to Cathleen May, Director for Science & Outreach, at GSA Headquarters, (303) 447-2020, ext. 195, or cmay@geosociety.org. You must be a current member of the Geological Society of America in order to apply for this opportunity. Application deadline is February 4, 2000.

Shape Tomorrow—Today!

an ethnically and culturally diverse campus community. Review of applications commences December 1, 1999. Contact Dr. Stanley Finney, Chair, Geological Sciences Department, California State University, Long Beach, 1250 Bellflower Boulevard, Long Beach, CA 90840-3902, or at scfinney@csulb.edu. CSULB is an Equal Opportunity Employer committed to excellence through diversity, and takes pride in its multicultural environment. An EEO/AA/Title IX/ADA Employer.

CLASTIC SEDIMENTOLOGY OR REMOTE SENSING/IMAGE PROCESSING

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

The Department of Geological Sciences at California State University, Northridge invites applications for a full-time, tenure-track position to be filled at the rank of Assistant Professor (salary range: \$40,488–\$51,036) starting in August, 2000. We seek applicants whose expertise is in either Clastic Sedimentology or Remote Sensing/Image Processing. A Ph.D. degree must be completed by the appointment date. Applicants must demonstrate a commitment to excellence in teaching and research at both undergraduate and graduate levels. Information about our Department can be obtained through our web page at www.geology.csun.edu. Applicants should send a detailed resume; a letter that describes their qualifications and teaching experience; a statement of their future research plans and goals; and the names, addresses, phone numbers, and e-mail addresses of three references familiar with their teaching and research experience and potential. Mail the above application materials to: Eugene Fritsche, Chair, Department of Geological Sciences, California State University, Northridge, CA 91330-8266. Applications will be accepted until January 7, 2000. Applications received after this date will be reviewed only if the position is not filled from the original pool of applicants. The University is an Equal Opportunity, Title IX, Sections 503 and 504 employer.

APPLICATION DEADLINE EXTENDED CENTRAL MICHIGAN UNIVERSITY MINERALOGY, ENTRY-LEVEL TENURE-TRACK POSITION

The Department of Geology invites applications for an entry-level tenure-track position beginning in August, 2000. We seek a person with the following qualifications: (1) recent PhD in geology with specialty in mineralogy, (2) teaching experience in mineralogy, (3) demonstrated commitment to high-quality undergraduate research, (4) research interests that complement existing departmental strengths, (5) commitment to field-based studies, (6) effective communication skills. The successful applicant will be required to (1) teach introductory geology courses as well as courses in his or her specialty, (2) develop collaborative research programs with departmental colleagues, and (3) develop and submit external research proposals. The Geology Department currently has eight full-time faculty and 15 to 25 undergraduate majors per class. Teaching loads will range from 9 to 12 contact hours per 15-week semester. Interested persons should send: (1) a resume, (2) a statement of teaching philosophy, research interests, and vision for undergraduate education, and (3) three letters of reference to: Mineralogist Personnel Committee, Department of Geology, Central Michigan University, Mt. Pleasant, MI 48859. Evaluation of candidates will begin on November 15, 1999, but applications and materials will continue to be accepted until the position is filled. For more information, visit our departmental Web site at www.cst.cmich.edu/units/gel. CMU is an AA/EEO institution.

COLLEGE OF CHARLESTON STRUCTURAL GEOLOGIST

The Department of Geology of the College of Charleston has a tenure-track position for a field-oriented structural geologist beginning in August of 2000 at the Assistant Professor level. Teaching responsibilities will include courses in structural geology, tectonics, and introductory geoscience courses. Candidates with an interest in Southern Appalachian geology or neotectonics are preferred. The candidate is also expected to conduct a sustained program of research and scholarly activity involving undergraduate and graduate students. A Ph.D. is required at the time of appointment. To apply, send a statement of teaching and research interests, a complete CV, and names of at least three references to: Dr. Mitchell Colgan, Search Committee Chair, Geology Department, College of Charleston, Charleston, SC 29424; phone (843) 953-7171. Review of applications will begin January 1, 2000, and continue until the position is filled. Additional information about the Geology Department can be obtained from www.cofc.edu/~geology. The College of Charleston is an AA/EEO/ADA employer and does not discriminate in the employment or the provisions of services on the basis of disability.

COLBY COLLEGE

ASSISTANT PROFESSOR GEOLOGY

Colby College seeks a dynamic teacher-scholar to join the three continuing members of the Department of Geology as a tenure-track Assistant Professor of Geology, beginning September 1, 2000; a candidate with Ph.D. in hand is preferred, but outstanding ABD candidates who will obtain their degree in AY 1999–2000 will also be considered. The successful candidate will be someone who will supplement existing Departmental strengths in paleontology, sedimentation, and stratigraphy; in mineralogy, petrology, and economic geology; and in surficial processes and Quaternary environments. Applications from structural geologists and hydrogeologists particularly are encouraged. To apply, please submit (1) a letter expressing interest with complete and up-to-date CV; (2) separate statements of teaching and research interests; and (3) transcripts of all college-level course work. At least three letters of recommendation addressing the applicant's teaching and research strengths and potential for external research funding should be sent directly to the Search Committee. Address applications to: Chair of Search Committee, Department of Geology, Colby College, 5800 Mayflower Hill, Waterville, ME 04901-8858. Colby College is an AA/EO employer and especially encourages applications from women and minorities. For more information on the College and Department, please visit the college Web site at www.colby.edu. Additional information pertaining specifically to this position may be found at www.colby.edu/geology/vacancy.html.

LOW TEMPERATURE/AQUEOUS GEOCHEMIST THE COLORADO COLLEGE

The Department of Geology announces a tenure-track position in low temperature/aqueous geochemistry. A primary responsibility will be to design an innovative 2nd-year course in Geochemistry/Mineralogy. Teaching will also include LT or Aqueous Geochemistry, Introductory Geology, Hydrogeology, and other courses in candidate's areas of interest. The Colorado College block calendar, in which professors teach, and students take, one course at a time for 3-1/2 weeks, lends itself to field- and project-based teaching. Faculty research and supervision of undergraduate research are essential. Candidates who can contribute to the diversity of the College curriculum and community are particularly encouraged to apply and to indicate how they might make such contributions. For further information about the Department visit our web page at: www.ColoradoCollege.edu/Dept/GY. Appointment will be at the assistant professor level to begin August 2000. Ph.D. is required. Send c.v., statement of teaching and research interests, and three letters of reference to: Eric Leonard, Chair, Department of Geology, Colorado College, Colorado Springs, CO 80903. Closing date: December 21, 1999. The Colorado College welcomes members of all groups, and reaffirms its commitment not to discriminate on the basis of race, color, age, religion, sex, national origin, disability, or sexual orientation. Equal Opportunity Employer.

DEPAUW UNIVERSITY ENVIRONMENTAL GEOLOGY

The Department of Geology and Geography at DePauw University invites applications for a three-year term position in Environmental Geology at the rank of Assistant Professor (Instructor for ABD) beginning August 15, 2000. We desire a person who is broadly trained in the geosciences with expertise in geochemistry/hydrogeology. The successful applicant will teach a variety of courses for undergraduate students including Physical Geology, Physical Geography, Geochemistry, and Applied Hydrogeology; will develop research projects for undergraduate students; and will possess excellent field and/or computational skills. Applicants should send a letter describing their teaching pedagogy and research interests, vita, transcripts of all academic work, and three letters of recommendation to Dr. Frederick M. Soster, Chair, Department of Geology and Geography, DePauw University, Greencastle, IN 46135. Review of applications will begin October 15, 1999, and will continue until the position is filled. DePauw University is an affirmative action, equal opportunity employer. Women and minorities are especially encouraged to apply.

EASTERN WASHINGTON UNIVERSITY STRUCTURAL GEOLOGIST

The Department of Geology, Eastern Washington University, invites applications for a tenure-track position at the assistant professor level in structural geology, to begin September 2000. We seek an applicant who is field-oriented, with a strong commitment to both teaching excellence and undergraduate research. The successful candidate will be expected to teach courses in their field of specialization and general introductory courses for majors and non-majors. Preference will be given to candidates who can teach courses in environmental science and engineering geology. In addition, the candidate is expected to develop and submit external grant proposals. A Ph.D. is

required. Applicants should send a curriculum vita and a cover letter with a statement of teaching philosophy and courses that could be taught, statement of future research plans, and have three letters of reference sent to: Chair, Search Committee, Geology Department, MS-70, Eastern Washington University, Cheney, WA 99004, by February 1, 2000. Applicants should arrange for their referees to send letters to the above address. Departmental information is available on our home page at www.geology.ewu.edu. EWU is an affirmative action/equal opportunity employer, and applications from members of historically underrepresented groups are especially encouraged to apply. The successful candidate will be required to show proof of eligibility to work in the U.S. pursuant to U.S. immigration laws.

FORT LEWIS COLLEGE STRUCTURAL GEOLOGIST

Fort Lewis College seeks an Assistant Professor of Geology. Tenure-track position anticipated Fall 2000. Ph.D. required. Primary teaching responsibilities include structure, tectonics, and physical geology. Must also be active in research/scholarly work, especially undergraduate research. Expertise and/or interest in geophysics, groundwater, economic mineral resources is desirable. Additional teaching obligations may include interdisciplinary general education courses. Send a letter of application, resume, statement of teaching and research goals, three letters reference and transcripts, postmarked by January 15, 2000, to: Dr. R. W. Blair, Jr., Department of Geology, Fort Lewis College, 1000 Rim Drive, Durango, CO, 81301-3999. FLC is an AA/EOE. Women and minorities are encouraged to apply.

UNIVERSITY OF IOWA ASSISTANT PROFESSOR IN VERTEBRATE PALEONTOLOGY

The Department of Geoscience at the University of Iowa invites applications for a full-time tenure-track Assistant Professorship in vertebrate paleontology, preferably one specializing in the Late Cenozoic. The appointment will begin in August 2000. In addition to developing an active, externally-funded program of research, the successful candidate will be expected to teach three courses per academic year. These will include: (1) an upper-level undergraduate/graduate course in vertebrate paleontology, (2) a general education course related to fossil vertebrates, and (3) a graduate seminar in paleontology. Applicants should have a Ph.D. in hand by August 16, 2000. Applicants should send a complete resume (including a bibliography and statement of teaching and research interests) and have at least three letters of recommendation sent to: Search Committee Chair (Vertebrate Paleontology), Department of Geoscience, University of Iowa, Iowa City, IA 52242-1379.

ASSISTANT PROFESSOR IN QUATERNARY GEOLOGY AND SOILS

The Department of Geoscience, University of Iowa, invites applications for a tenure-track Assistant Professor in Quaternary geology and soils. Teaching responsibilities will involve three courses per year including a rotation in one of our general education courses (Introduction to Environmental Science). Upper-level undergraduate/graduate courses will include Modern and Ancient Soils, Glacial and Pleistocene Geology, and other appropriate subjects depending on the candidate's expertise. All applicants should have the basic qualifications, which are a Ph.D. in hand by August 16, 2000, and a record of teaching and research in Quaternary geology and soils. Additional expertise in geochronology, Quaternary geochronology, quantitative methods, or other sub-fields is desirable. Applicants should send a complete resume (including a bibliography and statement of teaching and research interests) and have three letters of recommendation sent to: Dr. Richard G. Baker, Search Committee Chair, Department of Geology, University of Iowa, Iowa City, Iowa 52242-1379; phone: (319) 335-1827; fax: 319-335-1821; e-mail: dick-baker@uiowa.edu. Screening of candidates begins December 1, 1999, and will continue until the position is filled. The University of Iowa is an affirmative action, equal opportunity employer. Women and minorities are especially encouraged to apply.

IT CORPORATION

ENTRY-LEVEL—ENGINEER/SCIENTIST I

Under supervision, performs scientific tasks on a wide variety of technical projects for investigations through remediation/construction. Required: Minimum BSc. in geology or closely related discipline and 0 to 3 years experience or the equivalent combination of education and experience. Geologic skills commensurate with education and work experience; very good written and spoken communication skills,

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ability to follow direction, good problem-solving skills, ability to learn and apply new skills quickly; good interpersonal skills and ability to work as a member of multidisciplinary project teams. Ability to understand basic principles of technical project work, including client utilization, project budgets and expenditures.

MID-LEVEL—ENGINEER/SCIENTIST II

Provides technical support to environmental/hazardous waste projects ranging from investigation through remediation/construction. Uses independent technical judgement and the application of experience and technical skills to further project objectives. Required: BSc. or MSc. in geology or closely related discipline and 3 to 5 years of applicable experience. Should be in active pursuit of professional registration/certification. Strong general geologic skills commensurate with education and work experience; specialized skills in areas such as hydrology, hydrogeology, and chemical fate and transport desirable. Must have very good written and spoken communication skills, the ability to follow and provide direction, good problem-solving skills, as well as good interpersonal skills and the ability to work as a mature member of multidisciplinary teams. Ability to manage small to medium technical projects and to develop client contacts within project framework. Should be able to gain understanding of project financial reports and the relationships between project financials and corporate goals. May supervise technical professionals of various disciplines within project frameworks.

SENIOR-LEVEL—ENGINEER/SCIENTIST III OR IV

Provides lead or senior technical support to environmental/hazardous waste projects ranging from investigation through remediation/construction. Uses independent technical judgement and the application of experience and technical skills to further project objectives. Required: BSc. or MSc. in geology or closely related discipline and 5 to 9 years of applicable experience. Professional registration/certification requiring demonstrated expertise is strongly recommended. Very strong general geologic skills commensurate with education and work experience; developing or developed expertise in areas such as hydrology, hydrogeology, and chemical fate and transport required. Must have very good written and spoken communication skills, the ability to follow and provide direction, good problem-solving skills, as well as good interpersonal skills and the ability to work as a senior member of multidisciplinary teams. Ability to manage medium to large technical projects and to develop client contacts within and outside project framework. Ability to understand project financial reports and the relationships between project financials and corporate goals. Ability to select staff to meet project objectives and supervise a wide range of technical and non-technical personnel within the project framework. Career aspirations should include internal technical consulting, senior project, resource, or business management. Contact: Tom Battaglia, Director of Professional Staffing; The IT Group, 3347 Michelson Dr., Ste. 200, Irvine, CA 92612-0661; fax: 949-261-0861; e-mail: TBattaglia@theitgroup.com.

UNIVERSITY OF KANSAS

PETROLOGY OR THERMOCHRONOLOGY

The Department of Geology at the University of Kansas seeks applications for a 9-month, tenure-track faculty member in the field of petrology or thermochronology. We are seeking an individual with expertise in tectonic applications of geochemistry, thermochronology, or geochronology who will complement existing programs in isotope and elemental geochemistry, geochronology, geothermometry, and tectonics. This position initiates our plan for growth in the field of tectonics. Refer to www.geo.ukans.edu and links for additional information about our department and the University of Kansas. Starting date is August 18, 2000, or later; position and starting date are dependent on availability of funds. Position is contingent on budgetary approval. Salary range is \$44,000 to \$48,000 for a 9-month appointment, based on qualifications and experience. Applicants should send a letter of application outlining research and teaching interests, a complete resume, names and contact information of at least three persons who can be contacted for letters of reference if the search committee so desires, and transcripts of graduate work to: Prof. J. Douglas Walker, Search Committee Chair; Department of Geology, 120 Lindley Hall, University of Kansas, Lawrence, KS 66045-2124; phone: (785) 864-2735; fax: 785-864-5276; e-mail: jdwalker@ukans.edu. Review of completed applications will begin January 15, 2000, and will continue until the position is filled.

MICROBIAL HYDROGEOLOGY

The Department of Geology seeks to hire a hydrogeologist who can interact with the strong physical and chemical hydrogeology activities at the University of Kansas and build strength in the microbial hydrogeology area. The Department of Geology currently has two hydrogeologists and is well equipped for physical and chemical hydrogeology investigations. For additional information about the Department of Geology and the University of Kansas, visit our web site at www.geo.ukans.edu. Starting date is August 18, 2000, or later; position and starting date are dependent on availability of funds. Position is contingent on budgetary approval. Salary range is \$44,000 to \$48,000 for a nine-month appointment, based on qualifications and experience. Applicants should send a letter of application outlining research and teaching interests, a complete resume, names and contact information of at least three persons who can be contacted for letters of reference if the search committee so desires, and transcripts of graduate work to: Prof. Carl D. McElwee, Search Committee Chairman, Department of Geology, The University of Kansas, 120 Lindley Hall, Lawrence, Kansas 66045-2124; phone: (785) 864-2728; fax: 785-864-5276; e-mail: cmcelwee@ukans.edu. Review of completed applications will begin January 17, 2000, and will continue until the position is filled or closed. The University of Kansas is an Equal Opportunity/Affirmative Action Employer.

KENT STATE UNIVERSITY SURFACE-WATER HYDROLOGIST

The Department of Geology at Kent State University seeks to hire a surface-water hydrologist at the Assistant Professor level for the Fall semester, 2000. The successful candidate should possess the Ph.D., have a strong background in the geological sciences, and be able to interface well with other faculty working in a variety of water-related specialties. Specific research interests are open and may include, but are not limited to, such areas as quantitative analysis of fluvial systems; engineering applications; wetlands and groundwater-surface water interaction; vadose-zone hydrology; or coastal processes and engineering. We seek a scientist with experience in numerical modeling as well as interest in pursuing laboratory and field-based problems. Review of applications will begin on January 15, 2000. Candidates should send a letter of application, curriculum vitae, transcripts, a statement of research and teaching interests, and names of three references to Dr. Donald Palmer, Department of Geology, Kent State University, Kent, OH 44242; phone: (330) 672-2680; fax: 330-672-7949; www.kent.edu:80/geology/; e-mail: dpalmer@kent.edu. Kent State is an equal opportunity/affirmative action employer.

KENT STATE UNIVERSITY, TRUMBULL CAMPUS ASSISTANT PROFESSOR GEOLOGY

Kent State University, Trumbull Campus has a faculty position available Fall 2000 to teach undergraduate Geology courses in Earth Dynamics, Earth History, Environmental Geology and Oceanography at the Freshman and Sophomore level. The specialty is open. The Ph.D. is required for a tenure-track position. Candidates with the Masters degree will be considered for a non-tenure track term position which is renewable on a yearly basis. See www.kent.edu:80/geology or e-mail geology@kent.edu for more information on the department and its facilities, faculty, and educational programs. Review of applications will begin on January 15, 2000, and will continue until filled. Candidates should submit letter of application, curriculum vitae, transcripts, and three letters of reference to: Mr. Robert Sines, Assistant Dean, Kent State University, Trumbull Campus, 4314 Mahoning Avenue, Warren, OH 44483. Kent State is an equal opportunity/affirmative action employer.

LAURENTIAN UNIVERSITY ASSISTANT PROFESSOR— EXPLORATION GEOCHEMISTRY

We invite applications for a tenure-track position in Exploration Geochemistry. The ideal candidate will interact with the mineral exploration industry in utilizing chemical data to model ore deposition and/or hydrothermal alteration associated with mineral deposits. Experience in designing, conducting, and interpreting exploration lithochemical studies of magmatic (Ni-Cu-PGE), VMS (Cu-Zn-Pb), lode Au, and/or epithermal Au deposits, is desirable. Teaching will include undergraduate courses in low-temperature and hydrothermal geochemistry, and graduate courses in exploration geochemistry. Direction of graduate students within an active research program is expected. Sudbury is one of the world's largest nickel mining centers and is close to major VMS and gold deposits. The successful candidate will work with a large group of scientists studying the geology, mineralogy, petrology, and geochemistry of magmatic and hydrothermal ore deposits, with access to excellent analytical and computing equipment, including fluid

inclusion microthermometry, electron probe microanalysis, XRF, ICP-OES, ICP-MS, and TIMS. Further information can be found at: www.laurentian.ca/www/geology or by contacting: Chair, Department of Earth Sciences, Laurentian University, Sudbury, Ontario, P3E 2C6, Canada; e-mail: DES@nickel.laurentian.ca; fax: 705-675-4898

LOCKHEED MARTIN/NASA MICROBIOLOGIST/ORGANIC GEOCHEMIST TO SUPPORT THE SEARCH FOR EXTRATERRESTRIAL LIFE

Spacecraft are scheduled to return rocks and soil from the planet Mars within the next decade. The study of these samples will be a major step in the search for evidence of life beyond Earth. Mars sample return, as well as future sampling missions to comets and asteroids, will require unique laboratories and operations that protect both the samples and the environment from contamination. Currently there exists no functioning system that is capable of fulfilling all the requirements of planetary protection while maintaining clean room conditions for the sample. The NASA Johnson Space Center and its contractors are seeking a Ph.D.-level microbiologist or organic geochemist, experienced in trace-level analysis. Working experience in clean room or biosafety environments is highly desirable. The successful applicant will join a team researching issues of handling, preservation, and analysis of current and future extraterrestrial samples. Opportunities exist for research in JSC's laboratories, and collaboration with other investigators is strongly encouraged. This is a full-time position with a subcontractor to NASA at the Johnson Space Center in Houston, Texas. The salary and benefits package is competitive and dependent on qualifications. Please send your resume or CV to: Dr. Carlton Allen, Principal Scientist, Lockheed Martin Space Operations, 2400 NASA Road 1, Houston, TX 77058.

MANDEX

MANDEX, a subsidiary of MTS3, Inc., is a dynamic, growth-oriented company providing engineering and information technology services to Federal and commercial clients. We are seeking an individual with training and experience in GIS applications to serve as an Associate Analyst in Rockville, MD. Qualified candidates will hold at least a B.S. in Geology, Environmental Science, or Geography and possess computer skills and knowledge related to use of GIS software (specifically ARC/INFO and ArcView). Some experience is required with Unix-based operating systems, and knowledge of PC DOS or Windows NT would be beneficial. Qualified candidates may mail, fax, or e-mail resumes to MTS3 Inc., Recruitment Dept./GS 12500 Fair Lakes Circle, Suite 300, Fairfax, VA 22033-3804; fax: 703-227-0910; e-mail: hr@mts3inc.com. United States Citizenship Required EOE, M/F/D/V.

UNIVERSITY OF NEW MEXICO TENURE-TRACK POSITION IN GEOMORPHOLOGY

The Department of Earth & Planetary Sciences is accepting applications for a tenure-track faculty position in geomorphology beginning in Fall 2000. We anticipate hiring at the Assistant Professor level. Applicants must have a Ph.D. by the time of the appointment, research focus in fluvial and hillslope processes, with applications to climatic and/or tectonic geomorphology, demonstrable skills in GIS, and a strong field emphasis. A strong record of research and publication is essential. The successful candidate is expected to develop and maintain an active research and teaching program, to advise and direct graduate student research, and is encouraged to collaborate with other faculty. Teaching responsibilities include undergraduate- and graduate-level courses in field-based and quantitative geomorphology, including GIS, and introductory earth science courses. Department information is on our Web site: epswww.unm.edu. Applicants should submit a CV, graduate transcripts, copies of selected publications, a statement of teaching and research experience and interests, and the names and contact information of four referees to: Dr. Maya Elrick, Department of Earth & Planetary Sciences, University of New Mexico, Albuquerque, NM 87131-1116. Applications must be received by December 17, 1999. The University of New Mexico is an equal opportunity/affirmative action employer.

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE ONE SEMESTER LEAVE REPLACEMENT, SPRING 2000

Applications are invited for a one semester leave replacement position responsible for one section of physical geology, one section of historical geology and one introductory geology laboratory section in the Department of Geography and Earth Sciences, University of North Carolina at Charlotte. Specific duties include lecturing 3 hours per week per course, meeting one introductory geology laboratory, and

participation in field trips for both courses. Applicants should have at least a Masters in Geology; PhD is preferred. Starting date is January 12, 2000. Send applications, including curriculum vitae, statement of teaching experience, and names and addresses of three referees to Dr. Owen Furuseth, Department of Geography and Earth Sciences, University of North Carolina at Charlotte, Charlotte, NC 28223. Review of applications will begin on November 1, 1999, and continue until the position is filled. Additional information about the department is available at ga-mac.uncc.edu. The University of North Carolina at Charlotte is an equal opportunity/affirmative action employer.

UNIVERSITY OF NORTHERN COLORADO DEPARTMENT OF EARTH SCIENCES

Assistant Professor in Earth Science Education. We seek an individual with a doctorate (or ABD) and expertise in both science education and some area(s) of the earth sciences (geology, meteorology, oceanography, astronomy). Successful elementary, middle, or high school teaching experience is highly desirable. This tenure-track position will include teaching undergraduate and graduate courses in science education methods, earth science concepts for elementary teachers, and other introductory and advanced courses appropriate to the candidate's strengths. Additional duties will include participation in the teacher education partnership schools program, supervision of student teachers, development of an active research program focusing on pedagogy and/or applied earth science that involves undergraduate and graduate students, and service activities. Review of applications will begin December 1, 1999. Applications after this date may be accepted and review will continue until the position is filled. A complete application includes a letter of interest, vita, all college transcripts, and three letters of recommendation. For information, contact: Dr. William Nesse, Search Committee Chair, Department of Earth Sciences, Campus Box 100, University of Northern Colorado, Greeley, CO 80639; phone (970) 351-2830; e-mail: wdnesse@bentley.unco.edu; www.met.unco.edu.

PACIFIC LUTHERAN UNIVERSITY UNDERGRADUATE HYDROGEOLOGY AND INTRODUCTORY COURSES

The Department of Geosciences invites applications for a one-year sabbatical replacement position. The successful candidate must have the ability to teach an upper-division course in hydrogeology to Geosciences and Environmental Studies majors, and will teach introductory Geosciences courses and perhaps supervise senior capstone research. The ability to teach an introduction to meteorology will be a distinct asset. Applicants who can also teach an upper-division course in either cartography and GIS or igneous and metamorphic petrology may be considered for a two-year appointment. A Ph.D. in geological sciences is required. The appointment will begin on September 1, 2000. Information on the university and the department can be found at www.plu.edu. Please send a letter of application that includes a description of your teaching philosophy, a curriculum vitae, graduate school transcripts, and three letters of recommendations to Dr. Duncan Foley, Chair, Department of Geosciences, Pacific Lutheran University, Tacoma, WA 98447. The Department will begin its review of completed applications on December 15, 1999. Pacific Lutheran University enjoys a healthy and progressive relationship with the Evangelical Lutheran Church in America and is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF PUERTO RICO

The Department of Geology at the University of Puerto Rico invites applications for 2 to 3 tenure-track positions at the level of assistant professor. The field of expertise is open, but should complement existing departmental interests in igneous petrology, volcanology, engineering geology, geomorphology, paleontology, carbonate sedimentology, geochemistry, remote sensing and GPS geodesy. Candidates in earthquake seismology, applied geophysics, and hydrogeology are particularly encouraged to apply. The minimum qualification is a Ph.D. at the time of appointment. A strong commitment to an externally funded research program that involves B.S. and M.S. level students is required. For more information, visit our home page at www.geology.uprm.edu. Applications, including a curriculum vitae, a statement of research and teaching interests, and the names, addresses, telephone numbers, and e-mail addresses of 3 referees, should be sent to: Faculty Search Committee, Department of Geology, P.O. Box 9017, University of Puerto Rico, Mayagüez, Puerto Rico 00681-9017. Evaluation of applicants will begin on October 28, 1999, and continue until suitable candidates have been hired. We will be interviewing at AGU in San Francisco. The University of Puerto Rico, Mayagüez is an equal opportunity employer. Women and minorities are especially encouraged to apply.

SABBATICAL REPLACEMENT POSITION IN GEOLOGY

THE UNIVERSITY OF THE SOUTH

Applications are invited for a one-semester sabbatical replacement position beginning January 2000. Applicants will be expected to teach a field-based Hydrology course and Physical Geology. We seek a broadly educated, field-oriented individual with a strong commitment to teaching in a quality liberal arts program. At least one graduate degree in geology is required. Applicants should have the Ph.D. or be in the final stages of completion of the degree. Sewanee has a distinguished liberal arts program in which excellence in teaching is emphasized and research with students is encouraged. The attractive campus lies on the Cumberland Plateau within a 10,000-acre forested Domain which is used for teaching, research, and recreation. Field trips to various parts of the Cumberland Plateau, Valley and Ridge, and/or Blue Ridge are traditionally a major part of our laboratories. Review of applications will begin November 15, 1999. Applicants should send a curriculum vitae, undergraduate and graduate transcripts, three letters of recommendation, and a statement of teaching interests and experience to: Chair, Geology Search Committee, Department of Forestry and Geology, The University of the South, Sewanee, TN 37383. The University of the South is an equal opportunity employer, and encourages applications from women and minorities.

UNIVERSITY OF SOUTH FLORIDA AQUEOUS/HYDRO-GEOCHEMISTRY

The University of South Florida Department of Geology (www.cas.usf.edu/geology) is accepting applications for a tenure-earning Assistant Professor position to begin August, 2000, pending available funding. We are looking for a dynamic scientist, who will develop an active research program and mentor graduate students in groundwater/aqueous geochemistry. The expected teaching load is three courses/yr, including undergraduate courses and graduate-level courses in groundwater geochemistry and contaminant hydrogeology. A Ph.D. is required at the time of employment. Salary is negotiable. To apply, send a letter of interest, a current curriculum vitae (including a statement of research and teaching goals) and the names of three references to: Geochemistry Search Committee; Prof. Peter Harries, Chair, Department of Geology, University of South Florida, 4202 East Fowler Ave., SCA 528, Tampa, FL 33620-5201. Applications will be accepted until December 13, 1999. Inquiries about this position may be addressed to Peter Harries, e-mail: harries@chuma.cas.usf.edu. USF is an equal opportunity/affirmative action/equal access employer. Women and minorities are strongly encouraged to apply. Those persons requiring reasonable accommodation under the Americans with Disabilities Act should contact Peter Harries. According to Florida law, applications and meetings regarding them are open to the public.

STATE UNIVERSITY OF NEW YORK, COLLEGE AT CORTLAND STRUCTURAL GEOLOGIST

The Department of Geology of the State University of New York, College at Cortland has a tenure-track position for a Structural Geologist beginning in August of 2000 at the Assistant Professor level. Teaching responsibilities may include courses in structural geology, and introductory geoscience and Earth science education courses. Candidates with an interest in participating in, and possibly directing, the summer field geology programs at the Brauer Geology Field Station are preferred. The candidate is also expected to conduct a sustained program of research and scholarly activity involving undergraduate students. The Geology Department has a strong commitment to science education for the preparation of school teachers. A Ph.D. is required at the time of appointment. To apply, send a statement of teaching and research interests, a complete CV, and names of at least three references to: Christopher McRoberts, Search Committee Chair, Geology Department, SUNY Cortland, P.O. Box 2000, Cortland, NY 13045. Review of applications will begin January 1, 2000, and continue until the position is filled. Additional information about the Geology Department can be obtained from www.cortland.edu/geology. SUNY Cortland is an AA/EEO/ADA employer and does not discriminate in the employment or the provisions of services on the basis of disability.

UNIVERSITY OF TENNESSEE LOW-TEMPERATURE/ENVIRONMENTAL GEOCHEMIST

The Department of Geological Sciences at the University of Tennessee, Knoxville, invites applications for the Jones Environmental Chemistry Professorship, a tenure-track faculty position at the assistant professor level. We seek an individual with expertise in low-temperature, aqueous, or isotope geochemistry or biogeochemistry, with emphasis

on environmental applications. The appointment will begin on or after August 2000. A Ph.D. in geochemistry, environmental chemistry, or a related field is required. The Jones Professorship carries an annual stipend to support research activities. Applicants should send a resume, a letter describing research and teaching interests, copies of recent publications, a listing of relevant university courses, and the names and addresses of four references to Professor Harry McSween, Search Committee Chair, Department of Geological Sciences, University of Tennessee, Knoxville, TN 37996-1410; e-mail: mcsween@utk.edu. Review of applications will begin on January 10, 2000, and will continue until the position is filled. For additional information about the Department see our Web site: geoweb.gg.utk.edu. The University of Tennessee, Knoxville, does not discriminate on the basis of race, sex, color, religion, national origin, age, disability or veteran status in provision of educational programs and services or employment opportunities and benefits.

UNIVERSITY OF TEXAS AT EL PASO ANALYTICAL FACILITIES TECHNICIAN

The Department of Geological Sciences at the University of Texas at El Paso seeks candidates for a permanent full-time (12-month) position as Analytical Facilities Technician. Duties include maintenance of a Cameca SX50 electron microprobe, a Scintag XDS2000 XRD, a gamma-ray detection INAA unit, a variety of optical microscopes and other equipment, as well as assistance and training of faculty and students. Independent or collaborative research is encouraged, however, the primary focus of the position is successful operation of the facility. The candidate would also assume a variety of other duties including serving as safety officer and monitoring inventory. Minimum requirements include an M.S. or Ph.D. in geosciences, material sciences, or related fields. Direct experience with an electron microprobe and good communication skills are essential. Interested persons, should send a resume, and names of two references to: Dr. Kate C. Miller, Chair, Department of Geological Sciences, University of Texas at El Paso, El Paso, TX 79968-0555; e-mail miller@ge.utep.edu. We will begin reviewing applications on January 31, 2000, and will accept applications until the position is filled. The University does not discriminate on the basis of race, color, national origin, sex, religion, age, disability, or sexual orientation in employment of the provision of services.

ENVIRONMENTAL GEOLOGIST/ HYDROGEOLOGIST WINONA STATE UNIVERSITY

The Department of Geoscience, Winona State University, Winona, MN is hiring an entry-level, tenure-track, assistant-professor with a starting date of August 16, 2000. Candidates must have the Ph.D. in hand by start date. We are seeking an environmental geologist and/or a hydrogeologist who has a strong commitment to undergraduate teaching. The successful candidate will assume an active role in a new interdisciplinary environmental science option within the geoscience major, and will also direct the work of the department's water resources center. Environmental geologists and/or hydrogeologists who also have a background in geomorphology, geology of soils, geochemistry, and/or geophysics are especially encouraged to apply. Application must include a cover letter, at least three letters of recommendation, and transcripts of all academic work. Please submit applications to the Office of Affirmative Action, Somsen Hall, Winona State University, Winona, MN 55987. Review of dossiers began on November 15 and the position will remain open until filled. For a complete job description, see the Affirmative Action Office home page at www.winona.msus.edu/AffirmativeAction, or e-mail our office: affaction@vax2.winona.msus.edu, or call (507) 457-5639. For additional departmental information, go to www.winona.msus.edu/geology. Position available pending budgetary approval. Winona State University (MnSCU) is an equal opportunity educator and employer. Women, minorities, and individuals with disabilities are encouraged to apply.

UNIVERSITY OF WISCONSIN OSHKOSH PETROLOGIST/MINERALOGIST

The Department of Geology seeks a field-oriented, hard-rock geologist for a tenure-track, assistant professor position starting September 1, 2000. Ph.D. required; prior college teaching experience preferred. She or he will teach physical geology every year, upper-level undergraduate courses in igneous/metamorphic petrology, mineralogy, and possibly geochemistry, on an alternate-year basis, and occasionally a seminar or a spring field trip. Application deadline December 15, 1999.

Position Announcements
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Position Announcements
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SEDIMENTOLOGY OR PALEONTOLOGY

The Department of Geology seeks a field-oriented sedimentologist or paleontologist to complement our present carbonate stratigrapher. This tenure-track, assistant professor position starts September 1, 2000. Ph.D. required; prior college teaching experience preferred. The successful candidate will be expected to teach courses in his or her specialty as well as introductory courses. Preference will be given to candidates able to teach oceanography. Application deadline January 15, 2000. Please submit a letter of application, a concise statement of teaching and research interests and experience, a résumé, and all undergraduate and graduate transcripts (original or copy), to: Dr. William Mode, Chair, Department of Geology, University of Wisconsin Oshkosh, Oshkosh, WI 54901. Also have three current letters of reference sent directly to the department by deadline date. Information can be found at www.uwosh.edu/departments/geology. Phone: (920) 424-4460, fax: 920-424-0240. Nominees and applicants may request in writing that their identity not be revealed. The names of those not making such a request and the names of all finalists must be revealed upon request under state law. The UW Oshkosh is an EO/AE and encourages women and minorities to apply.

**UNIVERSITY OF WISCONSIN—PARKSIDE
SURFACE STUDIES,
APPLIED GEOMORPHOLOGY**

The Geology Department at the University of Wisconsin—Parkside has an opening at the associate/full professor level (tenured or tenure-track). The person hired must have a Ph.D. in geology and a very strong background in one of the following subspecialties of surface studies: applied geomorphology, soil science, or surface-water hydrogeology. The person hired will be expected to teach advanced courses in the geological specialties named above, and to be field oriented. The person must be able to show a record of excellence in teaching at the college level and must have an established record of funded research and publication. The starting salary will be competitive. The University of Wisconsin—Parkside is an AA/EEO employer and celebrates diversity by actively encouraging the inclusion and participation of individuals with different ideas and perspectives. To that end, the University seeks applications from qualified minorities, women, Vietnam-era veterans and disabled persons. The closing date for receipt of applications is January 20, 2000. Inquiries should be addressed to Dr. James H. Shea, Geology Department, University of Wisconsin—Parkside, Box 2000, 900 Wood Road, Kenosha, WI 53141; phone: (414) 595-2327; fax 414-595-2056; e-mail: james.shea@uwp.edu. Interested parties are invited to visit UW—Parkside's Web site.

**THE COLLEGE OF WOOSTER
IGNEOUS/METAMORPHIC PETROLOGY
AND MINERALOGY**

Visiting Assistant Professor of Geology. Applications are invited for a one-year, full-time visiting assistant professor position in the Department of Geology at beginning August 2000. The successful candidate will teach mineralogy and igneous and metamorphic petrology courses; she/he will also teach introductory geology courses (environmental geology, oceanography, or geology of natural hazards). Wooster has a strong undergraduate independent study program in which the successful candidate will participate as an advisor. Applicants for this position should have a Ph.D. or ABD. Interested persons should send a letter of application, curriculum vitae, and three letters of recommendation by January 15, 2000, to Dr. Lori Bettison-Varga, Chair, Department of Geology, The College of Wooster, Wooster, Ohio 44691. The College of Wooster is an independent college of the liberal arts and sciences with a commitment to excellence in undergraduate education. The College values diversity, strives to attract qualified women and minority candidates, and encourages individuals belonging to these groups to apply. Wooster seeks to ensure diversity by its policy of making appointments without regard to age, sex, creed, national origin, disability, handicap, sexual orientation, or political affiliation. The College of Wooster is an Equal Opportunity, Affirmative Action employer. ■

Position announcements from the GSA Employment Service are also on the Web at www.geosociety.org.

CLASSIFIED ADVERTISING

Published on the 1st of the month of issue. Ads (or cancellations) must reach the GSA Advertising office one month prior. Contact Advertising Department (303) 447-2020, 1-800-472-1988, fax 303-447-1133, or e-mail: acrawford@geosociety.org. Please include complete address, phone number, and e-mail address with all correspondence.

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Opportunities for Students		
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additional lines	\$1.35	\$2.35
Code number: \$2.75 extra		

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Positions Open

**TENURE-TRACK FACULTY POSITION IN
SEISMOLOGY/GEOPHYSICS,
UNIVERSITY OF KENTUCKY**

The Department of Geological Sciences at the University of Kentucky invites applications for a tenure-track faculty position at the Assistant/Associate Professor level in the area of seismology/geophysics beginning Fall 2000. The successful candidate will be expected to build upon an existing program in earthquake seismology and earthquake hazard reduction. Existing facilities include a regional strong-motion and seismic monitoring network, which is concentrated on the New Madrid Seismic Zone, in addition to extensive supporting equipment. This position offers a broad range of opportunities for cooperation with other departments and agencies (e.g., Kentucky Geological Survey, UK Department of Civil Engineering, Central United States Earthquake Consortium). In addition to assuring continuity of our earthquake research program, our new colleague will be expected to broaden the scope of research in geophysics in our department. Departmental programs currently emphasize tectonics, applied geosciences including engineering geology and hydrogeol-

ogy, and energy resources. Areas of research that will interface effectively with our existing strengths include crustal seismology, intraplate seismicity, and exploration geophysics. In addition to developing a vigorous research program, the new faculty member will be expected to develop and teach courses at both the undergraduate and graduate levels.

Interested applicants should submit a CV, a brief statement of research and teaching interests, copies of relevant research publications, and at least three letters of recommendation to: Dr. Sue M. Rimmer, Search Committee Chair, Department of Geological Sciences, 101 Stone Building, University of Kentucky, Lexington, KY 40506-0053. Applicants will be expected to show a proven record of publication and funding, and experience beyond the Ph.D. is desirable. For further information, please contact srimmer@pop.uky.edu or visit our web site: <http://www.uky.edu/AS/Geology/>. The committee will begin to review the applications on January 15, 2000. The University of Kentucky is an Affirmative Action employer, and applications from minority and female applicants are encouraged.

THIEL COLLEGE, GRENVILLE, PENNSYLVANIA

Theil College invites applications for a tenure-track, Assistant Professor in Physical Chemistry in a 4-person ACS-approved department beginning August 2000. Requirements include a Ph.D., excellence in teaching and a strong commitment to undergraduate liberal arts education. In addition to teaching in the major field, will teach in the general chemistry program and the environmental science program, and will supervise undergraduate research. Will develop and teach environmentally oriented, cross-disciplinary science courses with a particular emphasis on groundwater hydrology and the remediation of contaminated soil and groundwater. The successful candidate should be familiar with environmental sampling and measurement within the current regulatory environment. Further information can be obtained by e-mail from Dr. D. Bruce Armitage, Chair, darmitag@thiel.edu. Send resume and three reference letters to: Susan Swartzbeck, Personnel Director, Theil College, Greenville, PA 16125. Review of applications will continue until the position is filled. AA/EEO.

**ASSISTANT PROFESSOR OF EARTH SCIENCE
LEWIS & CLARK COLLEGE**

Lewis & Clark College seeks candidates for a new tenure-track position in earth science, available Fall 2000. The successful candidate will be appointed to the appropriate department in the Division of Mathematical and Natural

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CALENDAR

Only new or changed information is published in *GSA Today*. A complete listing can be found in the Calendar section on the Internet: <http://www.geosociety.org>.

2000 Meetings

January

January 23–28, State of the Arc 2000: Processes and Time Scales in the Genesis and Evolution of Arc Magmas, Mount Ruapehu, New Zealand. Information: Ian Smith, Dept. of Geology, University of Auckland, Private Bag 92019, Auckland, New Zealand, phone 64-9-373-7599, ext. 7416, fax 64 9 373 7435, ie.smith@auckland.ac.nz, http://center.ess.ucla.edu/iavcei/iavcei_home.html.

March

March 28–29, Petroleum Systems of Sedimentary Basins in the Southern Midcontinent, Oklahoma City, Oklahoma. Information: Kenneth S. Johnston, Oklahoma Geological Survey, University of Oklahoma, 200 East Boyd St., Room N-131, Norman, OK 73019, (405) 325-3031 or 1-800-330-3996, fax 405-325-7079.

May–June

May 29–June 2, Structural Controls on Resources: from Gold to Gas, a special session at GeoCanada2000, Calgary, Alberta. Information: Shoufa Lin, Dept. of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, (519) 888-4567, ext. 6557, fax 519-746-7484, shoufa@sciborg.uwaterloo.ca, www.geocanada2000.com.

June

June 14–16, Management Information Systems 2000, incorporating Geographic Information Systems and Remote Sensing, Lisbon, Portugal. Information: Gabriella Cossutta, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK, phone 44-238-029-3223, fax 44-238-029-2853, gcossutta@wessex.ac.uk.

June 18–23, Pacific Sections, American Association of Petroleum Geologists and Society of Petroleum Engineers, Western Regional Meeting Long Beach, California. Information: www.west.net/~psaapg or www.laspe.org.

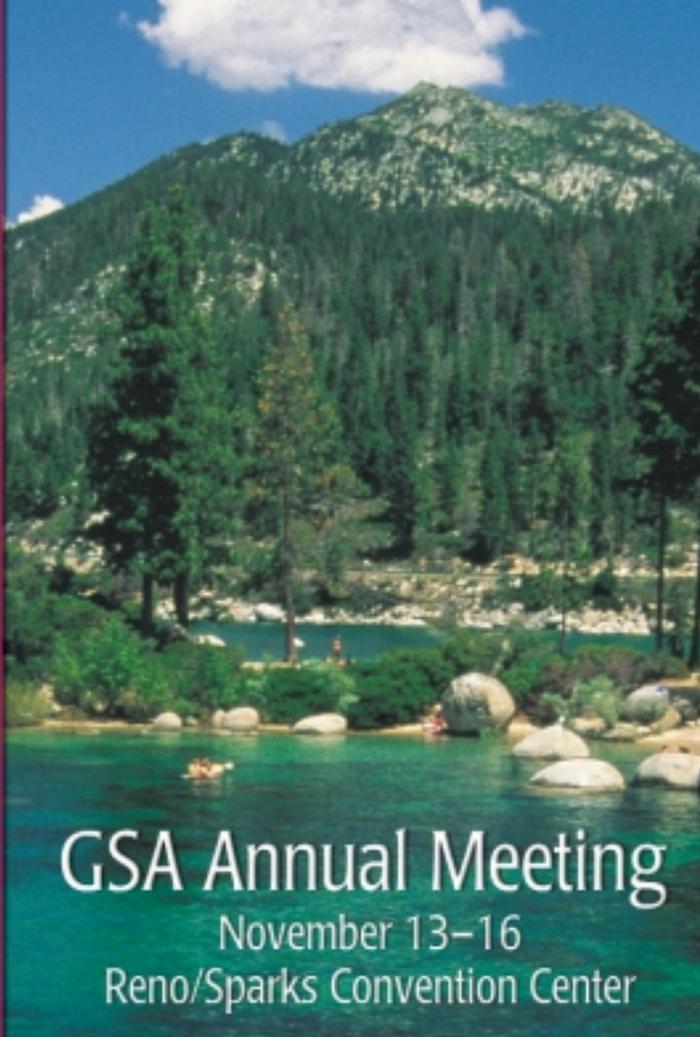


Summit 2000

CALL FOR TECHNICAL SESSION PROPOSALS

The electronic Pardee/Topical Session Proposal Form is now available on the GSA Web site. Deadline for proposal submission is January 10, 2000.

Summit 2000 is the largest and most important gathering of earth scientists in North America; in time, near the beginning of the third millennium; and in space, near the summit of the western ranges of the continent. One hundred years ago, no one could have envisioned what we now know about our planet, the technological advances we have made in imaging earth and planetary systems, or man's impact on Earth. Although it is even more difficult now to imagine the advances and challenges in the next century, it is important to reflect on the past and to look forward from the Summit toward distant horizons.



GSA Annual Meeting
November 13–16
Reno/Sparks Convention Center

GENERAL CHAIR
Richard A. Schweikert
(775) 784-6901,
fax 775-784-1833,
richschw@mines.unr.edu

TECHNICAL PROGRAM CHAIR
Robert Karlin
(775) 784-1770,
fax 775-784-1833,
karlin@mines.unr.edu

Both at
University of Nevada
Dept. of Geological Sciences
Mackay School of Mines
MS 172,
Reno, NV 89557-1038

Due date for Pardee Keynote
Symposia and topical
Session proposals:
January 10, 2000

First GSA Field Forum, March 18-22, 2000

Glaciohydraulic Supercooling, Basal Freeze-on, Stratified Basal Ice, and "Deformable Till Beds": Matanuska Glacier, Alaska

Leaders are Edward B. Evenson, Lehigh University; Daniel E. Lawson, Cold Regions Research and Engineering Laboratory; Grahame Larson, Michigan State University; and Richard B. Alley, Pennsylvania State University.

Recent debates concerning the nature and importance of deformable beds, ice-bed interactions and glaciohydraulic supercooling make a field forum focused on subglacial processes timely, especially with respect to the flow and dynamics of former ice sheets. This field forum—GSA's first—is designed to investigate the entire complex of processes operating at the base of the Matanuska Glacier, Alaska. The excellent winter exposures at the Matanuska Glacier will allow glacial geologists, glaciologists and structural geologists to simultaneously examine the spectacular, stratified, and debris-rich basal ice facies, the deforming till beds, and the complex ice and sediment deformation occurring in the basal ice and the bed of the glacier. One of the primary objectives of the forum will be to attempt to understand whether frazil ice and poorly laminated anchor ice evolve into the distinctly laminated "stratified basal ice," or if it forms directly from freeze-on in a subglacial, linked cavity system. Another objective will be to investigate the complex shear occurring in the deforming subglacial bed, in the stratified basal ice, and at the "shear zone" that separates the basal ice from the clean ice of the glacier body.

This forum begins in Anchorage, Alaska. Anyone in reasonably good physical condition should be able to visit all the sites on the itinerary. A winterized warming hut, located 200 m from the terminus of the glacier, will serve as the hub of activity on field days. A winter road allows vehicles and snowmobiles direct access to the snout of the glacier.

Participants must make their own travel arrangements to and from Anchorage. A flat fee of U.S. \$510 will be charged to cover all meals, local transportation, lodging, and access fees. Registration and cancellation deadline is January 15, 2000.

For Registration Applications and Information

Contact Edward B. Evenson
Dept. of Earth and Environmental Sciences
Lehigh University, Williams Hall #31
Bethlehem, PA 18015
(610) 758-3659 • fax 610-758-3677 • ebe0@lehigh.edu.

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Sciences and will support our environmental studies major by teaching earth science courses [primarily] as well as courses in the department, establishing an externally funded earth-science research program engaging undergraduate students, and participating in our general education program. The research specialty may be in any area of environmental earth science. Ph.D. in an earth-science field such as geology, geochemistry or geophysics required. Post-doctoral research experience preferred. Further information at: <http://www.lclark.edu/~esm>. Apply to: Prof. Evan T. Williams, Chair, Environmental Studies, Lewis & Clark College, 0615 SW Palatine Hill Rd., Portland, OR 97219. Applications must include CV, graduate and undergraduate transcripts, statements of research experience and interests and teaching interests/philosophy. Candidates must arrange to have recommendation letters sent by at least 3 referees. Review of applications will begin Dec. 1 and continue until position is filled. EOE.

SEDIMENTARY GEOLOGIST, AUBURN UNIVERSITY

The Department of Geology and Geography at Auburn University is seeking to fill a tenure-track position in sedimentary geology. The applicant's area of specialization could include, but is not limited to, diagenesis, sedimentary geochemistry, or related areas. Applicants must have a Ph.D., a record of independent scholarship, a demonstrated ability and willingness to teach, and the potential to attract graduate students. The position is available August 22, 2000, and will be filled at the Assistant Professor rank. The appointee is expected to develop and maintain an active, externally funded research program, to direct graduate (M.S.) students, and to participate fully in teaching at the graduate and undergraduate levels, including introductory geology courses in the university core curriculum. A curriculum vitae, a statement of teaching and research interests, and the names, addresses (standard and electronic), and telephone and fax numbers of three references should be sent to: Robert B. Cook, Department of Geology and Geography, 210 Petrie Hall, Auburn University, AL 36849. For additional information about the department and its faculty, please visit our web page at http://www.auburn.edu/academic/science_math/geology/docs. Review of applications will begin 12/15/99 and continue until a candidate is recommended for appointment. Auburn University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

LANDFORM EVOLUTION - UNIVERSITY OF MICHIGAN

The Department of Geological Sciences anticipates permission to fill a tenure-track position at the Assistant Professor level or, in exceptional cases, at a higher level. We seek a geoscientist with broad research interests in the physical aspects of the Earth's surficial processes. Areas of expertise may include, but are not limited to, quantitative geomorphology, neotectonics, satellite-based Earth observation, or the analysis of exposure surfaces. A field component to the candidate's research program is desirable. We expect the applicant to develop a vigorous, externally funded research program and to show a commitment to teaching at both the graduate and undergraduate levels. This includes involvement in our Environmental Geology degree program and in new interdisciplinary initiatives at the University of Michigan. A Ph.D. is required. Interested persons should send a curriculum vitae, names of five persons from whom the Department may request letters of recommendation, and brief statements of their research and teaching interests to: Prof. Ben A. van der Pluijm, Search Committee Chair, Department of Geological Sciences, University of Michigan, Ann Arbor, MI 48109-1063 (e-mail: vdpluijm@umich.edu). To receive a careful evaluation this academic year, applications should be received by January 1, 2000. This search will continue until the position is filled. The University of Michigan is an affirmative action, equal opportunity employer.

WILLIAM M. KECK FOUNDATION PROFESSORSHIP DEPARTMENT OF EARTH SCIENCES UNIVERSITY OF SOUTHERN CALIFORNIA

The University of Southern California invites applications for the W.M. Keck Foundation Professor in the Department of Earth Sciences. This appointment will be for an outstanding senior scientist in a discipline important to the long-term development and health of the Department. General programmatic areas of the applicant's field of research might include, but are not restricted to, earthquake science, global biogeochemical change, active tectonics, or crustal evolution and dynamics. The successful applicant will be expected to maintain a vigorous research program and provide programmatic leadership in his/her field of interest. Conditions of appointment are negotiable.

The university hopes to make the appointment by September 1, 2000.

Applications and nominations will be considered immediately. Screening of applicants will begin January 1, 2000, and continue until the selection is made. Applicants should submit a letter of application, curriculum vitae, and the names and addresses of four references to: Professor J. Lawford Anderson, Chair, Department of Earth Sciences, University of Southern California, Los Angeles, CA 90089-0740.

Nominations of potentially interested candidates can be transmitted via e-mail to: anderson@usc.edu or mailed to the above address.

The University of Southern California is an equal opportunity, affirmative action employer. Minorities and women are particularly encouraged to apply.

SEDIMENTOLOGIST UNIVERSITY OF NEVADA, LAS VEGAS

The Department of Geoscience at UNLV invites applications for a tenure-track position at the assistant professor level to begin Fall 2000. We seek a candidate with a strong background in field-based sedimentology and expertise in one or more of the following areas: siliciclastic and volcanoclastic rocks, tectonics and sedimentation, process-oriented sedimentology, geochemistry, or quantitative analysis. The successful candidate is expected to develop an externally funded research program, supervise graduate students at the master's and doctoral level and demonstrate a commitment to teaching excellence. Teaching responsibilities will include stratigraphy and sedimentology, introductory courses, and appropriate specialty upper division and graduate courses in our department. State-of-the-art research facilities include ⁴⁰Ar/³⁹Ar, microprobe, SEM, XRF, and GIS laboratories. For more information, see our Web sites: <http://www.unlv.edu> and <http://www.unlv.edu/Colleges/Sciences/Geoscience>.

Salary will be commensurate with qualifications and experience. Availability of the position is contingent upon funding. Candidates should submit a letter of application outlining teaching and research interests and philosophy, a curriculum vitae, unofficial academic transcripts, and names of three references to: Dr. Margaret N. Rees, Sedimentology Search, Department of Geoscience, University of Nevada—Las Vegas, 4505 Maryland Parkway, Las Vegas, NV 89154-4010, (702) 895-3890; rees@ccmail.unlv.edu. Review of applications will begin January 3, 2000, and continue until the appointment is made. Applicants must hold a Ph.D. by the start date. UNLV is an Equal Opportunity/Affirmative Action employer. Persons are selected on the basis of ability without regard to race, color, sex, age, national origin, sexual orientation, religion, disability or veteran status.

DEPARTMENT CHAIR / PETROLOGIST CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO

The Department of Geological Sciences at California State University, San Bernardino seeks a department chair (1/3 time-base) and petrologist at the level of Associate Professor or Professor for a position that will begin in September 2000. Primary teaching responsibilities (2/3 time-base, roughly two courses per quarter) will include Mineralogy, Optical Mineralogy, Igneous and Metamorphic Petrology, and Geochemistry, and other general geology courses as needed.

We seek a leader who can instill positive morale and can help a small department grow. The successful candidate should have a commitment to excellent undergraduate teaching and to involving undergraduates in research. A Ph.D. in the geological sciences and prior leadership experience are required. Prior, successful experience teaching at least some of the courses mentioned above and in publishing peer-reviewed research is also required.

Send letter of application along with curriculum vitae, undergraduate and graduate transcripts, three letters of recommendation, a statement of past leadership experience and current professional goals, and any other pertinent materials to Sally McGill, Acting Department Chair, Department of Geological Sciences, California State University, San Bernardino, 5500 University Parkway, San Bernardino, CA 92407-2397.

Review of applications will begin on February 14, 2000, and will continue until the position is filled.

The Department of Geological Sciences offers B.S. and B.A. degrees in geology, including a proposed option in Environmental Geology. For more information about the position, the university and the department please see: <http://geology.csusb.edu>.

California State University, San Bernardino is an equal opportunity employer committed to a diversified workforce.

SURFICIAL PROCESSES, TECTONICS, OR PALEOBIOLOGY, TULANE UNIVERSITY

The Department of Geology at Tulane University invites applications for a tenure-track Assistant Professor position to begin in the Fall of 2000. We are a small, but growing department with a current emphasis on the sedimentary and tectonic processes in fluvio-deltaic environments. We welcome applications from candidates whose research interests could complement those of our faculty (see <http://www.tulane.edu/~geology>). In particular, we seek applicants with specializations in one of the following fields: (1) surficial processes, (2) tectonics, or (3) paleobiology. Successful candidates must have completed their Ph.D. by the start date, would be expected to develop a vigorous, externally funded research program, and have a strong commitment to undergraduate and graduate teaching. Applicants should send a letter of application, statement of research and teaching interests, current curriculum vitae, and the names, addresses, and telephone numbers of three references to Stephen A. Nelson, Chair, Department of Geology, Tulane University, New Orleans, Louisiana 70118, e-mail snelson@mailhost.tcs.tulane.edu. The closing date for applications is January 15, 2000, although the search will remain open until the position is filled. Tulane University is an affirmative-action/equal opportunity employer. Women and minorities are encouraged to apply.

FACULTY POSITION QUATERNARY PALEOCLIMATE UNIVERSITY OF COLORADO, BOULDER

The Institute of Arctic and Alpine Research (INSTAAR), CU-Boulder, invites applications for an assistant professor tenure-track position in paleoclimate studies. We seek candidates with expertise in the quantitative reconstruction of Quaternary environments, including one or more of the following areas: paleoclimate, paleochemistry, high-precision geochronology and/or paleoclimate modeling. We seek applicants whose research complements established strengths within INSTAAR (paleoceanography, terrestrial paleoecology, Quaternary geochronology, ice-core paleochemistry, and biogeochemistry), and who can take advantage of related strengths within the University and in nearby Federal labs (USGS, NCAR, and NOAA). Applicants whose research addresses processes and mechanisms of climate change on timescales that are relevant to societal needs are preferred. Candidates will have a record or demonstrated potential of developing extramural research support and graduate student supervision; post-doctoral experience is desirable. Tenure will be with a partnering unit in the College of Arts and Sciences (e.g., Geography, Geological Sciences), according to the qualifications and interests of the applicant. The successful applicant will be expected to have a strong commitment to teaching at the undergraduate level and to participating in the graduate program in Quaternary studies. Although we expect to fill the position at the entry level, under exceptional circumstances applicants at a higher level may be considered. Additional information about INSTAAR and the University may be found at <http://instaar.colorado.edu>.

Candidates should submit a 2-page description of research and teaching interests, curriculum vitae, and the names of four referees to Gifford Miller (pclimate@colorado.edu), Search Committee Chair, INSTAAR, University of Colorado, Boulder CO 80309-0450. We will start our selection process with applications received in the current millennium. The University of Colorado at Boulder is committed to diversity and equality in education and employment.

CARBONATE SEDIMENTOLOGY/STRATIGRAPHY UNIVERSITY OF TEXAS AT AUSTIN

The Department of Geological Sciences at The University of Texas at Austin seeks a carbonate sedimentologist/stratigrapher who uses field relationships and petrology as primary research methods. Opportunities exist for interaction with faculty and students in the Department's programs in sedimentary geology, petroleum geology, paleontology, geochemistry, hydrogeology, exploration geophysics and tectonics (visit our web site at www.geo.utexas.edu). The successful candidate will have the ability to establish a vigorous research program and teach at both the undergraduate and graduate levels. A Ph.D. is required. Please send statement of research and teaching interests, resume, reprints, names and addresses of at least four references, plus any supplemental information to: Chair, Carbonate Sedimentology/Stratigraphy Search Committee, Department of Geological Sciences C1100, The University of Texas at Austin, Austin, TX 78712-1101. Closing date for applications is January 15, 2000. The University of Texas at Austin is an equal opportunity/affirmative action employer.

**SURFICIAL PROCESSES
UNIVERSITY OF MINNESOTA**

The Department of Geology and Geophysics at the University of Minnesota invites applications for a tenure-track Assistant Professorship in surficial processes, beginning Fall semester 2000. Applicants must have a doctoral degree or equivalent at the time of appointment and demonstrate strong potential for creative research and excellent teaching. The general theme area is evolution and dynamics of landscapes and surface processes. The successful candidate will be expected to establish a vigorous, externally funded research program and teach a course in geomorphology as well as other courses for graduate and undergraduate students, including nonmajors. The research area is open and could include terrestrial, extraterrestrial, and submarine systems; dynamics of glacial and periglacial regions; interplay of surface processes and tectonics; and links between climate and landscape. The Department of Geology and Geophysics has 24 faculty members, 25 research associates and post-doctoral fellows, and about 60 graduate students encompassing a broad range of geoscience research. Existing strengths in the School of Earth Sciences include the Minnesota Geological Survey, the Limnological Research Center, and the Institute for Rock Magnetism, along with energetic research groups in the Department in isotope and low-temperature geochemistry, solid-earth geodynamics, rock/mineral physics, structural geology/tectonics, hydrogeology, paleoclimatology, and sedimentary geology. We also maintain a wide array of modern analytical, experimental, and computational facilities and have strong ties with the St. Anthony Falls Laboratory (environmental fluid mechanics) and the Large Lakes Observatory (UM-Duluth). Interested applicants are invited to visit our web site (<http://www.geo.umn.edu>) to learn more about the School of Earth Sciences. Applicants should send a resume, a bibliography and a statement of teaching and research interests, as well as the names and addresses of at least three referees to Search Committee (Surficial Processes), Department of Geology and Geophysics, University of Minnesota, 310 Pillsbury Dr. SE, Minneapolis, MN 55455, USA (Phone: 612/624-1333; Fax: 612/625-3819). Applications will be accepted until the position is filled. Review of files will begin on January 15, 2000. The University of Minnesota is an equal opportunity educator and employer.

**PALEONTOLOGY-GEOBIOLOGY
UNIVERSITY OF MINNESOTA-TWIN CITIES**

The Department of Geology and Geophysics at the University of Minnesota invites applications for a tenure-track Assistant Professorship beginning Fall semester 2000 in the general area of paleontology/geobiology. Applicants must have a doctoral degree or equivalent at the time of appointment and demonstrate strong potential for creative research and excellent teaching. The research area could range from fossil-based study of the Earth and the history of life to interactions between biologic and geologic processes on all scales. The successful candidate will be expected to establish a vigorous, externally funded research program and to teach courses for graduate and undergraduate students, including nonmajors. We are particularly interested in a broad and creative scientist, and encourage applicants to explore research links within the department and the university. The Department of Geology and Geophysics has 24 faculty members, 25 research associates and post-doctoral fellows, and about 60 graduate students encompassing a broad range of geoscience research. Existing strengths in the School of Earth Sciences include the Minnesota Geological Survey, the Limnological Research Center, and the Institute for Rock Magnetism, along with energetic research groups in the Department in isotope and low-temperature geochemistry, solid-earth geodynamics, rock/mineral physics, structural geology/tectonics, hydrogeology, paleoclimatology, and sedimentary geology. We also maintain a wide array of modern analytical, experimental, and computational facilities and host a paleontology collection for teaching and research. We also have strong ties with the St. Anthony Falls Laboratory (environmental fluid mechanics) and the Large Lakes Observatory (UM-Duluth), and potential ties with the Bell Museum of Natural History. Interested applicants are invited to visit our web site (<http://www.geo.umn.edu>) to learn more about the School of Earth Sciences. Applicants should send a resume, a bibliography and a statement of teaching and research interests, as well as the names and addresses of at least three referees to Search Committee (Paleontology-Geobiology), Department of Geology and Geophysics, University of Minnesota, Minneapolis, MN 55455, USA (Phone: 612/624-1333; Fax: 612/625-3819). Applications will be accepted until the position is filled. Review of files will begin on January 15, 2000. The University of Minnesota is an equal opportunity educator and employer.

**COLLEGE OF NATURAL RESOURCES
UNIVERSITY OF WISCONSIN - STEVENS POINT**

Groundwater Scientist / Modeler (Associate Researcher, Academic Staff) Outstanding opportunity with an initial thrust of developing a regional groundwater flow model covering an 1100 square mile area. Two year position, with potential for an additional appointment contingent on availability of funding. The successful candidate will have an MS degree (Ph.D. preferred) in hydrology, hydrogeology, water resources, soil science, or allied field. Also required are competency in groundwater flow modeling, including use of commonly used pre- and post-processing software (e.g., GMS, Visual Modflow); excellent written and oral communication skills; excellent project management skills; and an interest in applied research for water resources management.

A full and official position description is posted at <http://www.uwsp.edu/admin/affaction/vacancy.htm>. Send letter of application, resume, copies of transcripts, and the names, addresses, and telephone numbers of three references to Prof. George J. Kraft, College of Natural Resources, 1900 Franklin St., Stevens Point, WI 54481. Questions can be referred to the above, or by email gkraft@uwsp.edu; or telephone (715) 346-2984. The University of Wisconsin - Stevens Point is an EEO/AA employer.

HYDROGEOLOGY, BATES COLLEGE

Applications are invited for a tenure-track position at the assistant professor level to begin in September 2000. The primary interest of the individual should be in the broad field of hydrogeology. Other complimentary interests could include geochemistry, geophysics, or G.I.S. The successful individual must have a Ph.D., possess a strong commitment to undergraduate education and is expected to develop a program of faculty research involving undergraduates.

This appointment is one of four full-time faculty positions in the Geology department, which offers a strong field-based and laboratory supported under-graduate program. The position presents a significant opportunity for curricular development and research and for developing interactions with other colleagues in geology as well as the other natural sciences and the environmental studies program. Teaching responsibilities include three courses (an introductory course and two upper level courses, all with laboratories), supervision of senior thesis research during the academic year and a five-week short term unit (April/May). The short term unit allows off-campus field study or intensive laboratory experiences and is the only course students take in the five weeks.

Bates College is a highly selective liberal arts and sciences college located in south-central Maine. The Geology department is housed in the recently renovated science center with ample space for teaching and research laboratories. Dedicated laboratories currently support classes and research in mineralogy, petrology, geochemistry (ICP), hydrology, sedimentology, structural geology and SEM-EDS. The department utilizes a dedicated computer teaching laboratory with 20 networked stations. The Geology department also has a substantial inventory of field equipment for geophysical, hydrological and traditional geology field research.

Review of applications will begin January 1, 2000, and continue until the position is filled. Applications should include a letter that discusses teaching and research interests, transcripts of all college course work, and the names, addresses and phone numbers of three referees from whom letters of recommendation may be solicited. Application materials may be sent to: Geology Search Committee Chair (#R2335), c/o Secretarial Services, 2 Andrews Road, 7 Lane Hall, Lewiston, ME 04240.

Visit the Bates web page at: www.bates.edu and www.bates.edu/acad/depts/geology/.

Bates College values a diverse college community and seeks to assure equal opportunity through a continuing and effective Affirmative Action Program.

**ASSISTANT PROFESSOR,
QUATERNARY PROCESSES**

The Department of Geological Sciences at California State University, Los Angeles invites applications for a full-time, tenure-track assistant professor position in the area of Quaternary processes. We are seeking an individual with applied and theoretical expertise in active fault geomorphology, soil formation processes, geomorphic processes, coastal environmental processes, and Quaternary dating techniques. The position will start in Fall, 2000 at an initial salary commensurate with qualifications and experience.

Applicants must have a Ph.D. in geology, demonstrated potential for effective teaching using a variety of methodologies, demonstrated ability and/or interest in

working in a multiethnic, multicultural environment, and potential for scholarly and creative activity. Duties will include teaching at the undergraduate and graduate level, directing graduate students, maintaining an active research program, participating in University service, and student advising.

Applicant documentation should include the following: letter of application describing research and teaching interests, curriculum vitae, three letters of recommendation, and transcript from institution awarding highest degree. Review of applications will begin on January 15, 2000. Address applications, required documentation, and/or requests for information to: Dr. Kim Bishop, California State University, Los Angeles, 5151 State University Drive, Los Angeles, CA, 90032-8203, www.calstatela.edu.

Cal State—LA is an equal opportunity/Title IX employer. Upon request, reasonable accommodation will be provided to individuals with protected disabilities.

**ASSISTANT PROFESSOR,
DEPARTMENT OF GEOLOGY,
UNIVERSITY OF KANSAS.**

Full-time, tenure-track, academic year appointment beginning August 18, 2000. The Department of Geology seeks a hydrogeologist who can interact with the strong physical and chemical hydrogeology activities at the University of Kansas and build strength in the microbial hydrogeology area. Duties include: Teaching hydrogeology and general geology courses; developing an active research program; advising graduate students; and providing service to the Department, the University, and the profession. Required qualifications: Ph.D. degree in geology or closely related field with emphasis in hydrogeology; ability to establish a research program in microbial hydrogeology; ability to teach introductory geology courses, hydrogeology, and contaminant transport; effective communication skills; eligibility to work permanently in the U.S. Preferred qualifications: Research experience in contaminant transport and microbial hydrogeology; evidence of research beyond the Ph.D.; demonstrated ability and competence in teaching. Application materials include: a letter of application outlining research and teaching interests; a complete resume; names, addresses, and telephone numbers of at least three persons who can be contacted for letters of reference, and transcripts of graduate work. Review of completed applications will begin January 17, 2000 and will continue until the position is filled. EO/AA employer. For a complete position announcement, or to make application contact: Carl D. McElwee, Department of Geology, University of Kansas, 120 Lindley Hall, Lawrence, Kansas 66045-2124, (785)864-2728, E-mail: cmcelwee@ukans.edu. For additional information about the Department of Geology and the University of Kansas, visit our web site at www.geo.ukans.edu. This position is contingent on budgetary approval.

**ASSISTANT PROFESSOR,
PETROLOGY OR THERMOCHRONOLOGY**

The Department of Geology at the University of Kansas invites applications for a tenure-track position of Assistant Professor in the field of petrology or thermochronology. The appointment will begin on August 18, 2000, with a later starting date possible. We are seeking an individual with expertise in tectonic applications of geochemistry, thermochronology, or geochronology. Duties include teaching at the undergraduate and graduate levels, developing and maintaining an active program of research, working with other faculty members to develop a stronger program in tectonics, and providing professional service to the Department, the University, and the profession.

Applicants must have a completed Ph.D. degree by the starting date. Candidates may be required to demonstrate eligibility to work in the U.S. A letter of application, a complete resume, graduate-school transcripts, and names and contact information of at least three persons, who can be contacted for letters of reference, should be sent to J. Douglas Walker, Search Committee Chairman, Department of Geology, University of Kansas, 120 Lindley Hall, Lawrence, Kansas 66045-2124 (tel: 785-864-2735; fax: 785-864-5276; e-mail: jdwalker@ukans.edu). Upon receipt of a letter of inquiry, we will send a detailed description of the position. Review of completed applications will begin January 15, 2000, 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. This position is contingent on budgetary approval.

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GSA National Park Interns Expand Public's Appreciation for Geology

The National Parks Undergraduate Geology Summer Internship program places undergraduate geology students in national parks to assist park personnel with geology-related work. Some park interns are involved in resource management, including taking inventory, monitoring, mapping, working with GIS, bibliographic and curatorial work, and ecosystem research. Other interns work with interpretive staff to include geology in visitor education programs. Now in its third year administering the internships, the Geological Society of America can report that this highly successful program has expanded from two interns serving in two national parks in 1997 to 10 interns in 10 parks in 1999.

Traditionally, national park management has not drawn on geoscience expertise. The National Park Service (NPS) employs more than 900 biologists but only 40 geologists. The national parks record more than 270,000,000 visits annually, so the lost potential for promoting the value of geology among the public is significant. Why is it necessary to have geoscience professionals on staff within the Park Service? Resource management requires knowledge of whole system interactions, of which geology is an active component. For example, soil and bedrock chemistry affects water chemistry, which affects species living in water. NPS interns serve a dual purpose of providing geoscience expertise to parks and educating visitors about the value of geoscience research.

The GSA National Parks Undergraduate Geology Summer Internship program results from successful collaboration between the National Park Service, providing housing, uniforms, and on-site support for the interns, and GSA, administering the program and securing financial support to provide a \$2500 stipend to each intern. In 1999, Shell Oil supported six interns, and the John F. Mann Foundation supported four interns and GSA administrative costs. The interns had responsibilities pertaining both to their park assignments and to GSA. Each intern had a park supervisor responsible for assigning duties and monitoring his or her work and well-being. GSA required interns to submit regular e-mail updates, take three rolls of photographs documenting their work, and write a final report.

Interns enjoyed an excellent summer learning experience in 1999. They deepened their knowledge of geology by applying concepts in a real-world setting and having the opportunity to see and work on geology that they might otherwise have only read about in text books. They also learned about resource management issues within the Park Service and how geology interfaces with other sciences within the Park Service. Many broadened their outdoor skills by living in remote areas. Others learned about safety issues and the danger of potential threats in the parks. Many interns expanded their research, discovering a need to deliver geologic information with greater accuracy and increased expertise.

Most important, students realized the impact they made on the visitors and the parks in which they worked. Mary Barnes, Oregon Caves intern, estimated that she had personal contacts with more than 400 visitors who previously knew little or nothing about the geology of the park. Matt Swanson, Mount Rainier intern, believes that he may have directly and indirectly reached over 10,000 visitors with his program to improve geologic awareness and understanding within his park.

GSA is creating a 1999 National Park Intern "Hall of Fame" on our Web site and hopes to continue this tradition in coming years. We are also preparing for our 2000 internship program. We will offer 10 internships next year, and we hope to offer more each year as members increase their donations to the program. If you are interested in the National Park Service Undergraduate Internship Program, please contact Stacey Ginsburg at sginsburg@geosociety.org or (303) 447-2020, ext. 194.

Nichole Alhadeff at Denali National Park, Alaska

Nichole Alhadeff graduated from Portland State University in May with a Bachelor of Science degree in geology. Her background includes work on the Juneau Icefield Research Program and in the university sedimentary lab. Nichole is a very active outdoors person and has volunteered several times to help manage outdoor and natural resource programs in Oregon.

Nichole Alhadeff at Denali National Park



Nichole was required to inventory and organize park geologic specimens. She also assisted in the development of geologic exhibits for interpretive facilities within a visitors center. Nichole was involved in sample identification, labeling, database input and the development of ideas regarding the geologic history of the park. Nichole was hired for an additional two months by the Park Service and spent much of this time traveling via helicopter to remote sites.

Mary Barnes at Oregon Caves National Monument, Oregon

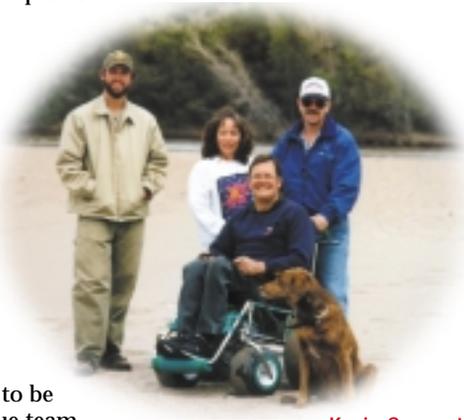
Mary Barnes graduated in May 1999 from the University of Washington, Seattle, with a Bachelor of Science degree in geology. She recently took a field geology course in Dillon, Montana, and worked for the Department of Psychology at the university.

Mary told us that her internship served as a great means of experiencing the role that the National Park Service plays in preserving, protecting, and sharing the nation's natural resources for and with the public. She was happy to be part of this tradition and to be able to share with visitors the special geologic story found at the Oregon Caves National Monument. Mary fulfilled this role by creating a program on Cave Formations of the Oregon Caves Monument as well as programs on many geologic and hydrologic resource management projects.

Kevin Casey at Great Sand Dunes National Monument, Colorado

Kevin Casey recently graduated from Earlham College in Richmond, Indiana with a double major in geology and religious studies. He has studied history, sociology, language, and conflict resolution in Jerusalem. He also has experience as an education intern at the Badlands National Park. Kevin sought this internship because he wanted experience working in and studying a new geological environment. He wants to pursue a future position with the National Park Service.

Kevin Casey developed and presented geology talks and slide programs for the park and worked at the visitor center. He also created a geology pamphlet defining geologic features of Great Sand Dunes in nonscientist's terms. In addition, in his "spare" time, Kevin volunteered to be part of a search and rescue team.



Kevin Casey at Great Sand Dunes National Monument

Susan Joy at Fossil Butte National Monument, Wyoming

Susan Joy graduated in May 1999 from Gustavus Adolphus College in St. Peter, Minnesota, with a bachelor's degree in geology. She collected fossils in Wyoming and Oklahoma and worked as a laboratory teaching assistant. Susan hopes to make a career in paleontology.

Fossil Butte National Monument is in the process of creating a virtual fossil quarry. Susan helped to further this goal by collecting, documenting, and photographing fish fossils in a quarry setting. She also prepared and curated specimens. In addition to work on the fossil quarry, Susan gave many interpretive presentations, during which she worked with children and adults to find fossils. She especially enjoyed the excitement of both adults and children when they uncovered fossils. "If one kid a day finds a fossil and gets excited about geology, then I feel like my work really means something," she said.



Susan Joy at Fossil Butte National Monument

Karrie Karpinski at Sleeping Bear National Lakeshore, Michigan

Karrie graduated in May 1999 from the College of Wooster in Wooster, Ohio, with a Bachelor of Arts degree in geology. During college, Karrie was a teaching assistant in several geology courses and also worked at Bat Metal, Inc. as a laboratory assistant. She plans on attending graduate school in sedimentology or a related field.

The Sleeping Bear Dunes park was established because of outstanding glacial features, including moraines, former water-courses, iceblock holes, perched dunes, and beach-dune ridge complexes. Karrie was responsible for creating resource materials on the glacial geology of the park and creating and presenting a weekly campfire program and nature hike for park visitors. One of Karrie's educational programs, "The Ice is Right! Geological Game Show of Sleeping Bear Dunes," teaches visitors about glaciers—past, present, and future. In addition, she organized a beach hike, "A Geologic Tour Through Time and Energy."

Lindy London at Lake Roosevelt National Recreation Area, Washington

Lindy London graduated in May 1999 from Utah State University in Logan, with a degree in geology. She also holds an Associate of Science degree from Snow College. Prior to the internship, Lindy worked in the geology department, helping out whenever needed.

Lindy provided park visitors with presentations and information about the prehistoric Ice Age floods that occurred in the area. Lindy also worked at Dry Falls State Creek, a state park located 35 miles south of Grand Coulee. She was the only NPS representative to work at Dry Falls and present geology-related programs. Lindy was also asked by the park service to extend her assignment to November.

Kelly Newman Moore at Florissant Fossil Beds National Monument, Colorado

Kelly Newman Moore will graduate from the University of Northern Alabama with a double major in biology and geology. She has a wide range of interests and activities, including tutoring and ROTC. Kelly would like to get a Ph.D. in paleontology and become an educator.

Kelly spent 60% of her time providing public education on the geologic and paleontologic resources of the area. She led informational walks, did on-site interpretation at active paleo digs, and helped in the museum and visitor center. The remainder of her time was spent working on self-selected projects from a list of park needs. Kelly incorporated park history into her nature walks, including that of Adeline Hornbek and the Hornbek homestead, and early paleontologist Samuel Scudder and the Scudder Pit. Kelly also spent time "gambling," as she puts it, at the fossil quarry. "As I split each shale layer, I just knew it would be the one to hold a beautiful dragonfly or butterfly."

Sara Spradlin at Capitol Reef National Park, Utah

Sara Spradlin will graduate from the College of William and Mary in Williamsburg, Virginia, in May 2000, with a major in geology and a minor in biology. She hopes to teach the public, especially children, about the natural world. Most recently, Sara volunteered with Geology on Wheels and was a teacher assistant for an introductory geology laboratory.

Sara developed and presented interpretive programs on the park's geologic resources by means of a geologic orientation, an afternoon talk, and a campground slide show. She also presented the park's established Junior Geologist program weekly. One of her greatest challenges was presenting information in a way that would not be too technical for visitors, yet not insult their intelligence. Sara experienced geology in action through flash floods and waterfalls and learned more about the cultural differences between Utah and Virginia.

Matt Swanson at Mount Rainier National Park, Washington

Matt Swanson received his degree in geology from Whitman College. He worked for the NPS during the summer of 1997 as a Visitor Use Assistant. He also has taught telemark skiing and produced four CDs for a band in which he plays guitar. Matt has traveled extensively to national parks throughout the United States and is an experienced outdoorsman.

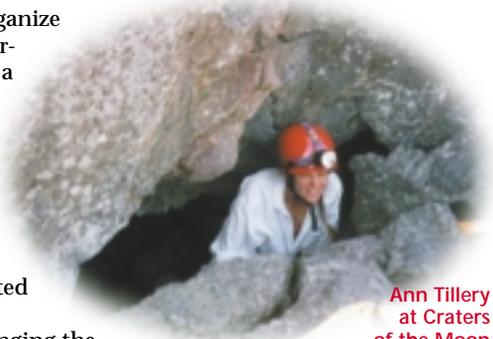
Matt was an interpretive ranger at the Jackson Visitor Center in Paradise, Mount Rainier National Park. He was also responsible for preparing four educational programs for visitors. In one, he worked with the theme of geologic time and a macro-scale history of the area surrounding Mount Rainier in order to demonstrate the dynamic nature of Earth, especially in volcanic regions. Feedback from visitors and his supervisor indicate that he accomplished his goal of influencing the way people view Earth, volcanoes, and geology.

Ann Tillery at Craters of the Moon National Monument, Idaho

Ann Tillery earned her second bachelor's degree, in geology at Arizona State University, in May 1999. She is currently working toward her graduate degree. She has worked for the Water Resources Division of the USGS and at Bandelier National Monument for the NPS.

Ann was hired to organize all of the park's cave information to date, to create a computer database for files, and to verify and record locations of the caves using a GPS unit.

She discovered that the park contains far more caves than previously known or suspected by present park staff. She inventoried 24 caves, bringing the current total to 129. Ann also hopes that her efforts will continue to contribute to the management of the geologic resources at Craters of the Moon for years to come. ■



Ann Tillery at Craters of the Moon National Monument

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NATIONAL SCIENCE FOUNDATION DIVISION OF EARTH SCIENCES

The National Science Foundation's Division of Earth Sciences is seeking qualified candidates for its "rotating" Associate/Program Director positions in the following programs: Geology & Paleontology, Hydrologic Sciences, Tectonics, Petrology & Geochemistry.

These positions are excepted from the competitive civil service and will be filled on a 1- or 2-year Visiting Scientist/Temporary basis (citizenship must be U.S. or a country with which the U.S. has a mutual security agreement and possesses appropriate employment authorization) or under the assignment provisions of the Intergovernmental Personnel Act (IPA). IPA applicants must be permanent, career employees of eligible organizations for at least 90 days prior to entering into a mobility assignment agreement with NSF. Reimbursement of salary and other related costs are negotiated between NSF and the individual's institution.

Current annual salary for the position ranges from: Associate Program Director—\$58,027 to \$91,410; Program Director—\$68,570 to \$106,868.

Primary responsibilities involve proposal evaluation, project development and support, program planning and budgeting, and related administrative duties.

Applicants must have a Ph.D. or equivalent experience in some field of earth sciences. In addition, for the Associate Program Director, at least 4 years of successful research, research administration and/or management experience beyond the Ph.D., and for the Program Director, at least 6 years of successful research, research administration and/or management experience beyond the Ph.D. in an area supported by the program is required. A broad general knowledge of earth sciences research and familiarity with the U.S. scientific community are desirable.

Interested applicants should submit a letter of recommendation and curriculum vitae to the National Science Foundation, Division of Earth Sciences, Attn: Myra Loyd, Room 315, 4201 Wilson Blvd., Arlington, VA 22230; and reference the following vacancy announcements:

Geology and Paleontology, Announcement EX00-05
Hydrologic Sciences, Announcement EX00-06
Tectonics, Announcement EX00-07

Petrology and Geochemistry, Announcement EX00-08

For technical information, call Dr. Herman Zimmerman, Acting Division Director, Earth Sciences, (703) 306-1550. Hearing-impaired individuals should call TDD: (703) 306-0189. NSF is an equal opportunity employer.

REMOTE SENSING/GIS DEPARTMENT OF GEOLOGY IDAHO STATE UNIVERSITY

We seek an earth scientist to fill a full-time, non-tenure-track Research Faculty position in Remote Sensing and GIS applications. A Ph.D. and U.S. citizenship are required. Excellent salary provided for three years, in anticipation of attracting ongoing extramural funding. Research duties include active participation in the university's Center for Integrated Environmental Analysis and the establishment of strong cooperative research ties with scientists in the ISU Geology Department and the Idaho National Engineering and Environmental Laboratory. Teaching duties include supervision of Geology M.S. students and 1-2 classes per year in specialty area. The successful candidate will have broad geologic interests and demonstrated proficiency in the application of Idrisi, IMAGINE, or ENVI software to solving geologic problems. See www.isu.edu for additional information. Send CV, statements of academic philosophy and research interests, and names of 3 referees to Search Committee, Department of Geology, Idaho State University, Pocatello, ID 83209-8072. Applications will be reviewed beginning December 1, 1999. ISU is an EO/AA Employer.

PETROLOGY BOWLING GREEN STATE UNIVERSITY

The Department of Geology invites applications for a tenure-track position at the Assistant Professor level starting August 2000. We seek a petrologist with specialization in some area of economic geology, which may include ore deposits, environmental remediation, or industrial minerals. The successful applicant will be expected to combine a commitment to excellence in undergraduate- and graduate-teaching with a productive research program including external funding. Teaching duties will include field geology, petrology in a team-taught mineralogy/petrology/geochemistry course, introductory geology, and advanced courses in the candidate's specialty. The successful candidate will teach in the Summer (field geology) with a commensurate reduction in teaching in either the Fall or Spring semester.

Department facilities include AAS, XRD, CL, USGS-type fluid inclusion stage, mineral kinetics and rock mechanics lab, geochemistry labs, complete rock preparation facilities, extensive field equipment including coring equipment and field vehicles, and exceptional computing facilities including UNIX workstations. A Ph.D. is required at the time of employment. Applications, including a complete resume, statements of research and teaching interests, and three current original letters of recommendation, should be sent to: Chair, Faculty Search Committee, Department of Geology, Bowling Green State University, Bowling Green, OH 43403. A transcript will be required at the time of hire. Completed applications must be postmarked by December 31, 1999. Bowling Green is an AA/EEO employer, and encourages applications from minorities, women, veterans, and persons with disabilities. The Department is responsive to the needs of dual-career couples. For more information, please visit our website at: <http://www.geoserv01.bgsu.edu>.

ENVIRONMENTAL GEOCHEMIST NORTHERN ILLINOIS UNIVERSITY

The Department of Geology and Environmental Geosciences invites applications for an anticipated tenure track position at the assistant professor level in the field of groundwater geochemistry to begin in August 2000. We seek a geochemist to support and complement our strengths in applied environmental geoscience. We are most interested in applicants with interests in the areas of environmental, contaminant, or organic geochemistry. The successful applicant will be expected to establish a vigorous externally-funded research program, supervise Ph.D. and M.S. students, and have a commitment to excellence in teaching at both the under-graduate and graduate levels. A Ph.D. in geosciences is required at the time of appointment. The Department offers programs leading to the B.S., M.S., and Ph.D. degrees, and currently has 14 faculty members, whose research and teaching interests are described on our web-site at <http://jove.geol.niu.edu>. Opportunities for close collaboration also exist with nearby research laboratories, such as Argonne National Laboratory, and with federal and state agencies and geological surveys. Applicants should submit a letter of application, curriculum vitae, statement of teaching and research interests, and names and addresses of at least three referees to: Chair, Search Committee, Department of Geology and Environmental Geosciences, Northern Illinois University, DeKalb, IL 60115. For equal consideration, applications should be received by January 10, 2000. Women and minorities are especially encouraged to apply. NIU is an affirmative action/equal opportunity institution.

LOW-TEMPERATURE / ENVIRONMENTAL GEOCHEMIST, UNIVERSITY OF TENNESSEE

The Department of Geological Sciences at the University of Tennessee, Knoxville invites applications for the Jones Environmental Geochemistry Professorship, a tenure track faculty position at the assistant professor level. We seek an individual with expertise in low-temperature, aqueous, or isotope geochemistry or biogeochemistry, with emphasis on environmental applications. The successful candidate will be expected to demonstrate great promise in teaching undergraduate and graduate courses; to develop a strong, externally funded research program that complements the Department's current efforts in hydrogeology and geochemistry; and to direct graduate theses and dissertations.

The appointment will begin on or after August 2000. A Ph.D. in geochemistry, environmental chemistry, or a related field is required. The Jones Professorship includes an annual stipend to support research activities. In developing his or her research program, an environmental geochemist may take advantage of the Department's strong ties with nearby Oak Ridge National Laboratory and the multidisciplinary UT Center for Environmental Biotechnology.

Applicants should send a resume, a letter describing research and teaching interests, copies of recent publications, a listing of relevant university courses, and the names and addresses of four references to Professor Harry McSween, Search Committee Chair, Department of Geological Sciences, University of Tennessee, Knoxville, TN 37996-1410; e-mail: mcsween@utk.edu. Review of applications will begin on January 10, 2000 and will continue until the position is filled.

For additional information about the Department see our Web site: <http://geoweb.gg.utk.edu/>. UT Knoxville is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

MINERALOGIST/PETROLOGIST, HUMBOLDT STATE UNIVERSITY

Appointment is for the 2000-2001 academic year only, with the possibility of renewal contingent upon programmatic need, budget, and/or evaluation.

Professional qualifications and duties: Ph.D. in geology at the time of employment, with specialization in mineralogy, igneous petrology, metamorphic petrology, or economic geology. Prior teaching experience is highly desirable. The successful candidate will be expected to teach the following courses: mineralogy, petrography, igneous and metamorphic petrology, field methods, field camp, economic geology, geochemistry. In addition, she/he will share teaching responsibilities for general education courses, including general geology and earth resources. The person hired is expected to maintain an active research program and advise M.S. candidates in the area of hard rock geology. The Geology Department is strongly field oriented, and the successful applicant should have a demonstrated interest and ability to teach students in field situations.

Humboldt State University is committed to achieving the goals of equal opportunity and Affirmative Action and endeavors to employ faculty and staff of the highest quality reflecting the ethnic and cultural diversity of the state.

Application: Qualified candidates should apply to: Search Committee Chair, Department of Geology, Humboldt State University, One Harpst Street, Arcata, CA 95521-8299, Phone: (707) 826-3931/FAX: (707) 826-5241. Application materials must include a detailed curriculum vita, graduate transcripts of academic work, and three recent letters of recommendation from persons familiar with the candidate's professional preparation and experience. Summaries of student evaluations of the candidate's teaching are welcome. All application materials, including letters of recommendation, must be postmarked no later than February 15, 2000. Applications from minority or women candidates are particularly encouraged. The University is an Equal Opportunity/Affirmative Action/Title IX Employer.

GEOPHYSICIST/ENVIRONMENTAL GEOLOGIST NORTHERN KENTUCKY UNIVERSITY

The Department of Physics and Geology invites applications for a tenure-track position at the assistant professor level in geophysics/environmental geology beginning in August 2000. Undergraduate teaching experience and a Ph.D. in geophysics (preferred) or geology with experience in environmental or applied geophysics are required. Teaching responsibilities will include upper division undergraduate courses and labs in environmental/applied geophysics, hydrogeology, and introductory geology courses with labs. Candidates will be expected to develop a modest research program that will include undergraduate geology and environmental science majors. The candidate will also be expected to contribute to the department's educational outreach programs to P-12 and non-traditional science students. Collaboration with NKU's emerging environmental science program, Environmental Resource Management Center and/or the Center for Integrative Natural Science and Mathematics offer the successful candidate additional professional opportunities. Send letter of application, curriculum vitae, separate statements of teaching philosophy and research interests, and the names, addresses, phone numbers, and e-mail addresses of three references to: Geology Search Committee, Department of Physics and Geology, Northern Kentucky University, Highland Heights, KY 41099-1900. Candidates may be required to submit additional documentation. Applications must be received by Feb. 15, 2000. For additional information on Northern Kentucky University visit <http://www.nku.edu>. Northern Kentucky University is an Equal Opportunity/Affirmative Action Employer.

FACULTY POSITION IN GEOLOGY RICE UNIVERSITY

The Department of Geology and Geophysics at Rice University seeks to fill a tenure-track faculty position at the Assistant Professor level beginning in August 2000.

We will consider applicants from all fields of the geosciences, but are particularly interested in scientists in paleoceanography, paleoclimatology, sedimentology, geochemistry, petrology, or structural geology. The successful candidate will be expected to conduct forefront research and to teach at the undergraduate and graduate levels.

Applications will receive the fullest consideration if submitted by January 15, 2000. Send an application, including a statement of teaching and research interests, curriculum vitae and the names and addresses of at least three referees to: Dr. Dale S. Sawyer, Acting Department Chair, Department of Geology and Geophysics, MS-126, Rice University, P.O. Box 1892, Houston, TX 77251-1892 (email: geol@rice.edu, <http://terra.rice.edu>).

Rice University is an equal opportunity employer. Women and minorities are invited to apply.

**SIMON FRASER UNIVERSITY
DEPARTMENT OF EARTH SCIENCES
ASSISTANT PROFESSOR IN
STRUCTURAL GEOLOGY**

The Department of Earth Sciences at Simon Fraser University invites applications for a tenure-track Assistant Professorship in structural geology commencing September 1, 2000. A Ph.D. is required and previous research, teaching or industry experience is desirable. It is expected that the research activities of the successful candidate will complement some aspect of our existing research interests within the Department. The successful candidate will develop a field-oriented research program, and supervise both graduate and undergraduate students. Teaching responsibilities will include structural geology, field camps, and advanced courses in the appointee's field of expertise. Eligibility for registration as a professional geoscientist (P.Ge) with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) is desirable.

For additional information about this position, see <http://www.sfu.ca/earth-sciences>.

In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. Simon Fraser University is committed to the principle of equity in employment and offers equal employment opportunities to qualified applicants. The position is subject to budgetary approval.

Applicants are requested to submit a curriculum vitae, a statement of research and teaching interests, and the names and addresses of three referees. Applications or requests for further information should be directed to: Dr. E. J. Hickin, Chair, Department of Earth Sciences, Simon Fraser University, 8888 University Drive, Burnaby, BC V5A 1S6, Phone: 604-291-4657; Fax: 604-291-4198; e-mail: hickin@sfu.ca. The closing date for applications is January 31, 2000.

**HYDROGEOLOGIST
FLORIDA INTERNATIONAL UNIVERSITY**

The Department of Geology at Florida International University (FIU) invites applications for a tenure-track position in hydrogeology to be filled at the assistant professor level. A Ph.D. in hydrogeology, groundwater hydrology, or a closely-related field is required. Duties include teaching undergraduate and graduate courses, and supervising M.S. and Ph.D. graduate students in hydrogeology. The successful applicant is expected to conduct innovative research on fluid flow and/or solute transport in porous media, including (but not limited to) representation of geological heterogeneity in models, numerical modeling or stochastic analysis of flow and/or transport, movement of non-aqueous phase liquids in the subsurface, or flow in fractured media. Applicants should send a resume (c.v.), statements of teaching and research interests, and the contact information (name, address, phone number, e-mail address) for three references to: Dr. Michael Gross, Search Committee Chair, Department of Geology, Florida International University, Miami, FL 33199 USA.

Application deadline is January 31, 2000. FIU is a member of the State University System of Florida and an equal opportunity/affirmative action/equal access employer.

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Books: Geology and History of Geology. Used, out-of-print, and rare. Free Catalog. Patricia L. Daniel, BS, MS, Geology. 618 W. Maple, Independence, KS 67301 ph: (316) 331-0725, fax: (316) 331-0785. E-mail: pldaniel@horizon.hit.net, website: www.hit.net/~pldaniel.

Opportunities for Students

Master's/Ph.D. Fellowship Available, Baylor University. The Department of Geology at Baylor University is pleased to announce the creation of the Wendlandt Fellowship, available to an outstanding incoming graduate student in the Fall of 2000. The fellowship is supported by an annual stipend of \$14,000 plus full tuition. More detailed information on the fellowship and on available graduate programs can be obtained at: www.baylor.edu/~Geology/studentinfo.html. In addition to the Wendlandt

Fellowship, there are also a number of teaching assistantships available at \$12,000/yr + tuition (Master's) or \$15,000/yr + tuition (Ph.D.'s). For information or application, please contact Dr. Thomas Goforth, Baylor University Dept. of Geology, PO Box 97354, Waco, TX 76798-7354; (254) 710-2361; e-mail: tom_goforth@baylor.edu.

Graduate Student Opportunities. A recent large endowment to the Department of Geology & Geophysics, University of Missouri—Rolla allows us to offer very competitive financial support to qualified graduate students. Programs leading to the M.S. and Ph.D. degrees include: aqueous & environmental geochemistry, igneous petrology & geochemistry, sedimentary petrology & geochemistry, sedimentology & biostratigraphy, economic & petroleum geology and applied exploration & environmental geophysics. The Department is well equipped and situated in a modern facility. For information about programs, faculty and admissions please access the Department's home page at: <http://www.umsr.edu/~geo-geop/> or write to: Graduate Advisor, Department of Geology & Geophysics, University of Missouri—Rolla, Rolla, MO 65409-0410.

Research Assistantships/Hydrology/N. M. Tech. Graduate research assistantships are available for students interested in working on projects related to a recently-funded NSF Science & Technology Center on Sustainability of Water Resources in Semiarid Regions in which the Hydrology Program at New Mexico Tech is a lead participant. This center was formed to address the growing problems of increasing water demand and declining water quality in the southwestern United States. The objective of the Center is not only to obtain new scientific insights into the hydrological system, but also to develop and present the scientific results in such a way that they can actually be applied to the resolution of water resources problems in the near future.

We encourage applications from students seeking M.S. or Ph.D. degrees who are interested in the following research topics: Basin-scale water and salinity balance, employing isotopic and environmental tracer techniques; land-atmosphere interactions, using surface and remote sensing observations and numerical models; Vadose zone processes and groundwater recharge.

Research will be focussed on the hydrology of the Rio Grande Basin. Interaction with water users and managers in the basin is an important part of the planned research. Model simulations will be completed using the advanced computing facilities at Los Alamos National Lab.

We are currently accepting applications for assistantships beginning in both Spring and Fall Semesters, 2000. For additional information, contact Fred Phillips, e-mail: phillips@nmt.edu, Dept. of Earth & Environmental Science, New Mexico Tech, Socorro, NM 87801, <http://www.ees.nmt.edu/Hydro/homepage.html>.

Graduate Student Support Opportunities in Earth Sciences, Lehigh University—The Department of Earth and Environmental Sciences of Lehigh University has Graduate Student Fellowships for highly qualified individuals. The department has active research programs in tectonic studies (geochronology, stable isotope geochemistry, low temperature geochemistry, seismology, high resolution geophysics, structural geology, paleomagnetism) and surficial processes (low temperature geochemistry, fluvial and tectonic geomorphology, glacial geology, hydrology, and limnology). Please contact Prof. D. Morris, Dept. of Earth and Environmental Sciences (dpm2@lehigh.edu) or see our Web page for more details (<http://www.ees.lehigh.edu>).

Department of Geosciences, University of Arizona, announces the availability of Sloan Scholarships for minority Ph.D. students in the geosciences. The Alfred P. Sloan Foundation and the Department of Geosciences are committed to increasing the number of African-American, Hispanic-American, and Native-Americans receiving Ph.D.s in the geosciences. Sloan scholars receive fellowship support, three summers of research support, a research allowance, and peer and faculty mentoring. Additional support through other fellowships, and teaching or research assistantships is also available. Inquiries and requests for applications to: Graduate Program, Department of Geosciences, The University of Arizona, Tucson, AZ 85721. Or gradapps@geo.arizona.edu and <http://geo.arizona.edu>.

Jonathan O. Davis Scholarship, administered by the Division of Earth and Ecosystem Sciences, Desert Research Institute. The family and friends of Jonathan O. Davis, a prominent geologist and geoarchaeologist, have established an endowment that provides an annual

scholarship of \$2,000. Jonathan was tragically killed in an automobile accident in December 1990. It is the wish of his family and friends to support graduate students working on the Quaternary geology of the Great Basin and surrounding areas. The scholarship is open to graduate students enrolled in an M.S. or Ph.D. program at any university in the United States. "Quaternary geology" encompasses a wide range of topics normally considered as part of the Quaternary sciences. The research, however, must have a substantial geologic component or demonstrate a strong reliance on geological techniques. Applications should include: (1) a cover letter explaining how the individual qualifies for this particular award (please include your social security number); (2) a current résumé or vitae; (3) a two-page, single spaced description of the thesis/dissertation research, which also clearly documents the geological orientation and research significance; (4) a letter of recommendation from the thesis/dissertation supervisor that emphasizes the student's ability and potential as a Quaternary scientist. Applications must be postmarked by February 1, 2000. Applications should be addressed to: Interim Executive Director, Division of Earth and Ecosystem Sciences, Desert Research Institute, 2215 Raggio Parkway, Reno, NV 89512. Contact: Mary Ann Moran, (775) 673-7458; or e-mail mmoran@dri.edu.

NASA Planetary Biology Internships. The Marine Biological Laboratory, Woods Hole, Massachusetts, invites applications from graduate students and seniors accepted to graduate programs for rewards of \$2200 plus travel to participate in research at NASA centers and collaborating institutions for approximately 8 weeks. Typical intern programs include: global ecology, remote sensing, microbial ecology, biomineralization, and origin and early evolution of life. Application deadline: March 1, 2000. For information/applications, contact: Michael Dolan, Planetary Biology Internship, Department of Geoscience, Box 3-5820, University of Massachusetts, Amherst, MA 01003-5820. E-mail: pbi@geo.umass.edu. Tel (413) 545-3223. An Equal Opportunity/Affirmative Action Employer.

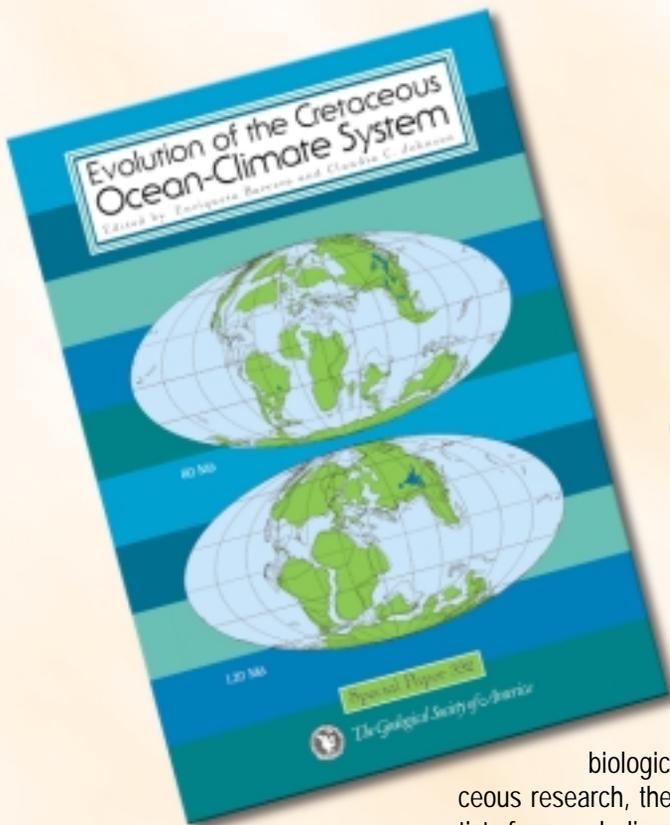
Graduate Studies in Geology & Geophysics, Boston College. The Department of Geology & Geophysics at Boston College invites applications for graduate study. Students can earn the MS (Master of Science) degree in Geology or Geophysics; the MS/MBA (Master of Science/Master of Business Administration) degree involving Boston College's Carroll Graduate School of Management, or the MST (Masters of Science in Teaching) in Geology.

We seek applicants with undergraduate degrees in a variety of subject areas, including biology, chemistry, computer science, earth science, engineering, environmental studies, and mathematics.

Research opportunities are available in interpretive tectonics, structural geology, seismology, environmental geology and geophysics, coastal and estuarine processes, and global change geochemistry. Boston College offers both Teaching and Research Assistantships.

Applications received by February 1, 2000, will receive fullest consideration. For more information, or an application, contact Geology & Geophysics Department, Boston College, Devlin Hall 213, Chestnut Hill, MA 02467; phone (617) 552-3640; or visit our website at <http://www.bc.edu/geology>.

Graduate Fellowship / Boise State University. The Department of Geosciences seeks applicants for graduate teaching and research fellowships in the M.S. Geology, M.S. Geophysics, and Ph.D. Geophysics programs beginning fall semester 2000. Each fellowship includes a competitive stipend plus all tuition and fees. Current research is in the following areas: petrology, structure and tectonics, stratigraphy and paleontology, Quaternary geology and geomorphology, neotectonics, watershed hydrology and surficial processes, paleoclimatology and paleoceanography, hydrogeology, and engineering and environmental geophysics. Additional information including descriptions of specific research projects, faculty profiles, and program requirements available at <http://cgiss.boisestate.edu/geoweb/home.html>. Request application materials from Dr. Paul Donaldson, Department of Geosciences, Boise State University, 1910 University Drive, Boise, ID 83725, Voice: 208-426-3639, FAX: 208-426-4061, e-mail: pdonalds@boisestate.edu. Application deadline: 15 January 2000. ■



SPE332, 445 p.
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Evolution of the Cretaceous Ocean-Climate System

edited by E. Barrera and C. C. Johnson, 1999

The latest GSA volume focusing on an integrated systems approach to understanding the Cretaceous greenhouse world, this state-of-the-science research brings together the latest interpretations of data and models from both the marine and continental realms. Syntheses and specialized papers by more than 21 contributors highlight significant events or processes in the evolution of Cretaceous ocean-climate and

biological systems, from a regional to a global scale. In the forefront of Cretaceous research, the volume will stimulate ongoing vigorous debate among concerned scientists from such diverse disciplines as marine biology, sedimentology, and tectonics.

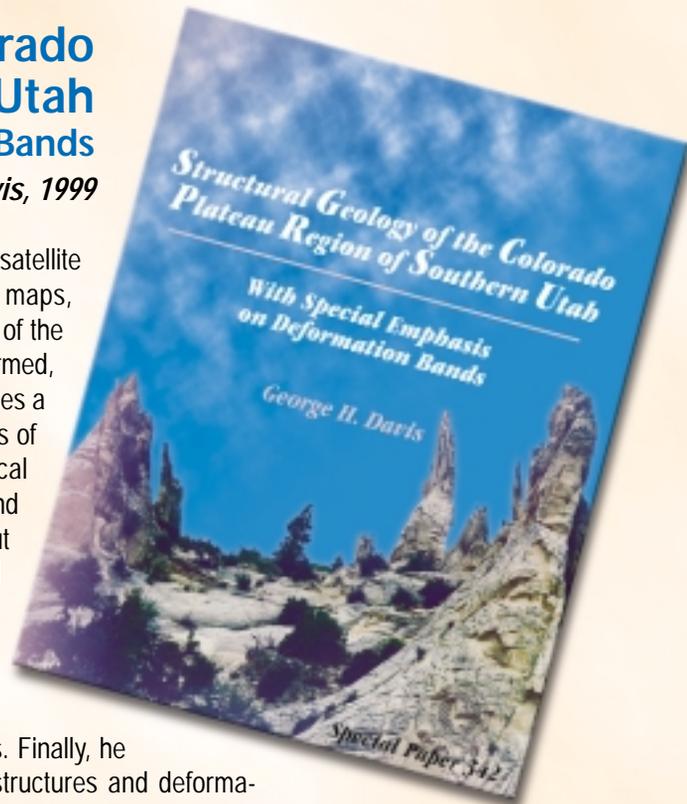
Structural Geology of the Colorado Plateau Region of Southern Utah with Special Emphasis on Deformation Bands

by G. H. Davis, 1999

This volume features an abundance of high-quality illustrations: space satellite images, aerial photographs, outcrop photographs, photomicrographs, maps, stereographic images, and line drawings. These images reveal that rocks of the Colorado Plateau region of southern Utah are surprisingly strongly deformed, especially in comparison to how they are generally regarded. Davis provides a detailed, integrated overview of the major structural and tectonic elements of the region, and discusses the rock column there in terms of mechanical stratigraphy. He also presents the results of comprehensive mapping and

analysis of deformation band shear zones throughout the region, using orientations and kinematic characteristics of these bands as guides to strain environment and progressive deformation within and

along the major structures. Finally, he integrates the regional structures and deformation bands in a tectonic context. Readers will be intrigued by the visual detail of the images and the mapping and analysis Davis adds to the text.



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