

## Geoscience Horizons: Seattle 2003

### GSA Annual Meeting & Exposition

November 2–5, 2003  
Washington State  
Convention & Trade  
Center, Seattle

#### ANNUAL MEETING SPONSOR



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#### Greetings!

Multifaceted Seattle provides a fascinating arena for the GSA Annual Meeting. Seattle is an amazing place—aesthetically, culturally, and geologically. In few other North American cities do Holocene lahars lap up against the downtown shopping district, active surface faults bisect half-billion-dollar sports stadiums, glacial fjords float ten thousand commuters daily to their climate-controlled office buildings, and recent landslides the size of small New England townships provide home to million-dollar views for software executives and coffee moguls. If you've never been to Seattle, come to experience a place, for better or worse, like none other. If you know the city like the back of your hand, revisit old friends and resample the local beverages. For the rest of you, enjoy the continuing evolution of one of the most unique cities, and settings, of our continent.

**Geoscience Horizons: Seattle 2003 promises to be an exciting meeting.** There's a great set of field trips and workshops, technical sessions, and the opportunity to make or renew collegial connections. The meeting has a broad range of sessions that both encompass and expand the boundaries of traditional "geologic" studies. So, examine the session titles, find your niche, and offer your contribution by submitting an abstract. If you don't find your topic area, please submit to one of the general sessions—your session-mates may well be the most eclectic, creative group at the meeting. Come to Seattle and experience the beautiful "Emerald City."

Derek Booth  
General Chair, Seattle Local Committee

#### IMPORTANT DATES, EVENTS, & DEADLINES

Registration Opens:	June 2
Abstracts Deadline:	July 15
Preregistration Deadline:	September 26
Registration Cancellation Deadline:	October 3
Premeeting Field Trips:	Sun.–Sat., Oct. 26–Nov. 1
Short Courses & Workshops:	Sat., Nov. 1
K-16 Workshops:	Sat.–Sun., Nov. 1–2
Presidential Address & Awards Ceremony:	Sun., Nov. 2, 4–6 p.m.
Welcoming Party & Exhibits Opening:	Sun., Nov. 2, 6–8 p.m.
Technical Program:	Sun.–Wed., Nov. 2–5
Pardee Keynote Symposia:	Sun., Nov. 2, 8 a.m.–noon Mon.–Wed., Nov. 3–5, 8 a.m.–noon, & 1:30–5:30 p.m.
Private Alumni Receptions:	Mon., Nov. 3, 5:30 p.m.–1 a.m.
Group Alumni Party:	Mon., Nov. 3, 7–9:30 p.m.
Exhibits Open:	Mon.–Tue., Nov. 3–4, 9:30 a.m.–5:30 p.m.
Exhibits Close: NEW!	Wed., Nov. 5, 2 p.m.
Hot Topics:	Mon.–Wed., Nov. 3–5, over lunchtime
Postmeeting Field Trips:	Wed.–Sat., Nov. 5–8

## Associated Societies

American Association of Stratigraphic Palynologists ■ American Institute of Professional Geologists  
Association for Women Geologists ■ Association of American State Geologists ■ Association of Earth Science Editors  
Association of Engineering Geologists ■ Association of Geoscientists for International Development  
Council on Undergraduate Research, Geosciences Division ■ Cushman Foundation  
Environmental & Engineering Geophysical Society  
Geochemical Society ■ Geoscience Information Society ■ History of the Earth Sciences Society  
International Association of Hydrogeologists ■ Mineralogical Society of America  
National Association for Black Geologists and Geophysicists  
National Association of Geoscience Teachers ■ National Earth Science Teachers Association  
National Ground Water Association ■ Paleontological Research Institution ■ Paleontological Society  
Sigma Gamma Epsilon  
Society for Sedimentary Geology ■ Society of Economic Geologists ■ Society of Vertebrate Paleontology

## Allied Societies

American Association of Petroleum Geologists ■ Asociación Geológica Argentina ■ Geological Association of Canada  
Geological Society of Australia ■ Geological Society of London ■ Geological Society of South Africa  
Soil Science Society of America

## GSA Welcomes These New Associated and Allied Societies

### GSA ASSOCIATED SOCIETY

Environmental & Engineering Geophysical Society ([www.eegs.org](http://www.eegs.org))

### GSA ALLIED SOCIETIES

Geological Association of Canada ([www.gac.ca](http://www.gac.ca))  
Geological Society of South Africa ([www.gssa.org.za](http://www.gssa.org.za))  
Soil Science Society of America ([www.soils.org](http://www.soils.org))



## Attention All GSA Associated Society and GSA Division Leaders:

*Did you ever wait until the last minute to plan an event only to find out no meeting space was available?*

You can avoid panic and frustration by planning now for your business meeting, alumni party, reception, banquet, or social event at the Seattle GSA Annual Meeting. To reserve space for your event at the headquarters hotel or at the convention center, make your plans NOW and complete the Meeting Space Request form online.

**Step 1.** Start planning NOW.

**Step 2.** Go to [www.geosociety.org](http://www.geosociety.org).

**Step 3.** Click on “Meetings and Excursions,” then “Geoscience Horizons Seattle 2003”

**Step 4.** Go to the Meeting Space Request Form and complete it online.

*Thank you!*

## PARDEE KEYNOTE SYMPOSIA

### INVITED PAPERS

*The Pardee Keynote Symposia are made possible by a grant from The Joseph T. Pardee Memorial Fund.*

These Pardee Keynote sessions are *special events* of broad interest to the geoscience community. They represent hot issue topics on the leading edge in a scientific discipline or area of public policy, address broad fundamental issues and are interdisciplinary. Selection was on a competitive basis. This year's seven Pardee Keynote sessions were reviewed and accepted by the Annual Program Committee. (*All speakers are invited.*)

#### **P1 Global Climate Changes: Abrupt Late Pleistocene Climatic Reversals and Modern Global Warming**

*GSA Quaternary Geology and Geomorphology Division*

Don J. Easterbrook, Western Washington University, Bellingham, WA; Ed Evenson, Lehigh University, Bethlehem, PA; John Gosse, Dalhousie University, Halifax, NS, Canada

This session will explore global, late Pleistocene, rapid climatic changes, focusing on the Younger Dryas and Intra-Allerod Cold Period, and aspects of global warming during the past century and earlier natural climatic changes.

#### **P2 His View of Life: Reflections on the Scientific Legacy of Stephen J. Gould**

*Paleontological Society*

Warren D. Allmon, Paleontological Research Institution, Ithaca, NY; Patricia Kelley, University of North Carolina, Wilmington, NC; Robert M. Ross, Paleontological Research Institution, Ithaca, NY

This session will explore the legacy of Stephen Jay Gould. Speakers will reflect

upon and attempt to clarify Gould's views, some of which were widely misunderstood, and explicate interrelationships among his views in disparate subjects.

#### **P3 Modeling Metamorphism: Petrology, Geochemistry, and Tectonics**

*Mineralogical Society of America, Geochemical Society; GSA Structural Geology and Tectonics Division*

Michael Brown, University of Maryland, College Park, MD; Barbara L. Dutrow, Louisiana State University, Baton Rouge, LA

Metamorphism involves the study of global-scale cycles, for example, from diagenesis to exhumation of metamorphic rocks, and from ocean floor sedimentation to formation of mountain belts and global climate change. This session addresses a broad theme that is fundamental for mineralogy, petrology, geochemistry, tectonics and earth system science.

#### **P4 Neoproterozoic Geobiology: Fossils, Clocks, Isotopes, and Rocks**

*GSA Geobiology and Geomicrobiology Division; Paleontological Society; Geochemical Society; Precambrian (at large)*

Shuhai Xiao, Tulane University, New Orleans, LA; Alan J. Kaufman, University of Maryland, College Park, MD

Sedimentologists, paleontologists, geochemists, and earth system modelers are brought together to present new data and models (stimulated by the "snowball Earth" hypothesis) on the Neoproterozoic Earth, in order to better understand the relationship between tectonic, climatic, and biological change at the end of the Proterozoic Eon.

#### **P5 Preservation of Random Mega-scale Events on Mars and Earth: Influence on Geologic History**

*GSA Planetary Geology Division*

Mary G. Chapman, U.S. Geological Survey, Flagstaff, AZ; Lawrence H. Tanner, Bloomsburg University, Bloomsburg, PA

This session presents the state of our understanding of large-scale, rapid-acting geologic processes, such as bolide impact, superplume eruption, catastrophic flood, and edifice collapse that are obvious on Mars yet scarcely recognized on Earth.

#### **P6 The Paleoenvironmental and Paleoclimatic Framework of Human Evolution**

*GSA Archaeological Geology Division, GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; Society for Sedimentary Geology (SEPM)*

Gail M. Ashley, Rutgers University, Piscataway, NJ; Craig S. Feibel, Rutgers State University, New Brunswick, NJ

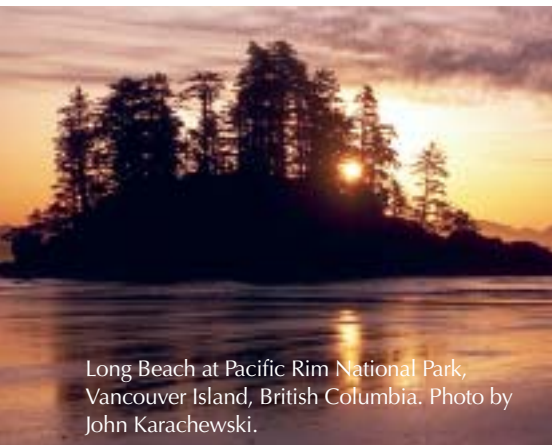
Recent discoveries and established facts regarding the paleoenvironment and paleoclimatic context of human evolution will be examined with the goal of shedding some light on the puzzle of human origins.

#### **P7 The Science of Lewis and Clark: Historical Observations and Modern Interpretations**

*GSA Engineering Geology Division; U.S. Geological Survey; U.S. Department of the Interior; GSA History of Geology Division; History of Earth Science Society*

Paul M. Santi, Colorado School of Mines, Golden, CO

The year 2003 is the 200th anniversary of the initiation of the Lewis and Clark Expedition. This session will gather scientists, historians, and science policy makers to explore the scientific impacts of the expedition as well as the changes in scientific interpretations and government support of science since the expedition.



Long Beach at Pacific Rim National Park, Vancouver Island, British Columbia. Photo by John Karachewski.

# Call for Papers

## TOPICAL & DISCIPLINE SESSIONS

### INVITED AND VOLUNTEERED PAPERS

ABSTRACTS DEADLINE: JULY 15

#### TOPICAL SESSIONS

Below is a listing of all approved topical sessions. These sessions are topically focused with a mix of invited and volunteered papers. Sessions are designed to promote the exchange of interdisciplinary, state-of-the-art information. Papers can be submitted to a specific topical session, and you may choose up to three scientific categories. After each topical description below, the categories are identified as they appear on the abstract form. PLEASE SUBMIT ONLY IN THE MODE (oral or poster) AND CATEGORIES INDICATED in the description. An abstract submitted in the incorrect mode will be transferred automatically to a discipline session.

ABSTRACTS DEADLINE: JULY 15

Please use the online electronic abstract form at [www.geosociety.org](http://www.geosociety.org). An abstract submission fee will be charged. The fee is \$18 for all students; \$30 for all others. If you cannot submit your abstract electronically, contact Nancy Carlson, (303) 357-1061, [ncarlson@geosociety.org](mailto:ncarlson@geosociety.org).

#### DISCIPLINE SESSIONS

From the list found on the electronic abstract form, you may choose up to three discipline categories you feel your abstract would fit best. Joint Technical Program Committee representatives organize the papers in sessions focused on disciplines (e.g., environmental geoscience or mineralogy).

#### TOPICAL SESSIONS

##### **T1 The Peopling of the New World: Geology, Archaeology, and Paleoenvironments**

.....  
*GSA Archaeological Geology Division; GSA Quaternary Geology and Geomorphology Division; Society for American Archaeology*

Archaeological Geology; Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Vance T. Holliday, University of Arizona, Tucson, AZ

The session will focus on the environments, landscapes, and archaeology of North and South America in the late Pleistocene (ca. 30,000–10,000 years B.P.) as they relate to the earliest arrival of humans on both continents. ORAL

##### **T2 Geoarchaeology of Historic and Urban Sites**

.....  
*GSA Archaeological Geology Division*

Archaeological Geology; Quaternary Geology/Geomorphology; Engineering Geology

David L. Cremeens, GAI Consultants, Inc., Monroeville, PA; Julie K. Stein, University of Washington, Seattle, WA

The goal of the session is to bring together geoarchaeologists, historical archaeologists, and historians to discuss geoarchaeological concepts and practices as applied to historic and urban archaeological sites. ORAL

##### **T3 Impending Disaster—The Impact of Population Growth on Water Availability and Quality**

.....  
*U.S. National Committee for the Geological Sciences; U.S. National Committee for Geodesy and Geophysics; GSA Geology and Public Policy Committee; GSA Hydrogeology Division*

Environmental Geoscience; Engineering Geology; Hydrogeology

Grant Heiken, Los Alamos National Lab, Los Alamos, NM; Patrick Leahy, U.S. Geological Survey, Reston, VA; Farouk El-Baz, Boston University, Boston, MA

This session will provide the framework in which geoscientists work to support supplies of potable water to the world's cities. ORAL

##### **T4 Mathematical Modeling of Earth Surface Processes: The Good, the Bad, and the Ugly**

.....  
Environmental Geoscience; Engineering Geology; Public Policy

Robert S. Young, Western Carolina University, Cullowhee, NC; Orrin H. Pilkey, Duke University, Durham, NC

Mathematical models are heavily relied upon for public policy decision making, but decision makers are often unaware of model shortcomings. This session aims to provide a forum for discussion of similar problems in widely varying fields, approaches for overcoming model shortcomings, and practical limits of model applications. ORAL

##### **T5 Terroir, Geology, and Wine: A Tribute to Simon J. Haynes**

.....  
*Society of Economic Geologists*

Economic Geology; Quaternary Geology/Geomorphology; Remote Sensing/Geographic Info System

Lawrence D. Meinert, Washington State University, Pullman, WA

Papers are encouraged on any aspect of Terroir—the interplay of wine and geology, including the impact of soils, bedrock, hydrology, GIS, and climatology. This session follows a premeeting field trip to examine outstanding vineyards, wineries, and terroir of Washington State. ORAL

##### **T6 Geology of Salmon**

.....  
Environmental Geoscience; Quaternary Geology/Geomorphology; Paleontology/Paleobotany

David R. Montgomery, University of Washington, Seattle, WA

The geology of salmon ranges from paleontological evidence for their evolution and radiation to changes in their abundance due to climate change and habitat loss, and the role of geomorphological disturbance processes in population dynamics. ORAL

**T7 Geologists in the U.S. Peace Corps: The Contribution of Peace Corps Geologists to International Development and the Contribution of the Peace Corps Experience to the Development of the Geosciences in America**

*GSA International Division; Association of Geoscientists for International Development; U.S. Peace Corps; Ghana Geological Survey; U.S. Geological Survey*

Public Policy

Robert A. Levich, Las Vegas, NV; R. Stephen Saunders, NASA, Arlington, VA; Ernest W. Kendall, Seabrook, TX

Contributions of American Peace Corps geologists to developing nations and the international community and the effect of Peace Corps service on the careers of American geologists and the geologic profession. This session will also explore whether the U.S. Peace Corps should continue to send geologists to serve in the developing world. ORAL

**T8 The Role of Geology in the Management of Public and Private Western Temperate Forest Lands**

*GSA Quaternary Geology and Geomorphology Division; GSA Engineering Geology Division*

Quaternary Geology/Geomorphology; Engineering Geology; Environmental Geoscience

Wendy J. Gerstel, Washington State Department of Natural Resources, Olympia, WA; Matthew J. Brunengo, Portland, OR

This session assembles current research and case studies on the application of geologic and geomorphic mapping and modeling as tools in habitat assessment and locating and designing structures, recreational facilities, and resource extraction activities on forested lands. ORAL and POSTER

**T9 The Proposed Deep Geologic Repository for High-Level Radioactive Waste at Yucca Mountain, Nevada: Attributes of the Natural System**

*U.S. Department of Energy*

Public Policy; Environmental Geoscience

Ronald M. Linden, Las Vegas, NV; Robert A. Levich, Las Vegas, NV; Ardyth Simmons, Lawrence Berkeley National Lab, Berkeley, CA

Aspects of the natural system relevant to the siting and safe operation of the proposed high-level waste repository at Yucca Mountain, Nevada. Topics include regional geology, site geology, tectonics and tectonic hazards, climate, unsaturated zone hydrology, saturated zone hydrology, rock geochemistry, and factors affecting radionuclide transport. ORAL

**T10 Mega-Events on Earth and Mars: Record, Recognition, and Consequences (Posters)**

*GSA Structural Geology and Tectonics Division*

Planetary Geology; Volcanology; Quaternary Geology/Geomorphology

Lawrence H. Tanner, Bloomsburg University, Bloomsburg, PA; Thorvaldur Thordarson, University of Hawaii, Honolulu, HI

This poster session explores large-scale, rapid-acting geologic processes that are obvious on Mars, yet scarcely recognized on Earth, and their influence on planetary history. Examples include bolide impact, superplume eruption, catastrophic flood, and edifice collapse. POSTER

**T11 Expanding Extraterrestrial Geoscience Horizons: Planetary Remote Sensing**

*GSA Planetary Geology Division*

Planetary Geology; Remote Sensing/Geographic Info System; Geochemistry, Other

Michael S. Kelley, Georgia Southern University, Statesboro, GA

A diverse group of leading planetary geologists who do not typically attend the same sessions will discuss problems, solutions, and results from remote sensing of solid planetary bodies. ORAL

**T12 Advances in Analytical Techniques and New Approaches to the Study of Ore Deposits**

*Society of Economic Geologists*

Economic Geology; Geochemistry, Aqueous; Geochemistry, Other

Werner Halter, ETH Zurich, Zurich, Switzerland; Thomas Pettke, ETH Zurich, Zurich, Switzerland

This session will focus on recent advances in analytical techniques (e.g., laser-ablation, MC-ICPMS, Raman, SIMS, SXRF) that provide new insight into the study of ore deposits.

Submissions are encouraged on the analytical techniques themselves as well as the results of their use in experimental, microanalytical, and field studies. ORAL and POSTER

**T13 Cathodoluminescence of Quartz in Hydrothermal Ore Deposits**

*Society of Economic Geologists*

Economic Geology; Geochemistry, Aqueous; Geochemistry, Other

Brian Rusk, University of Oregon, Eugene, OR

Cathodoluminescence of quartz reveals textures that yield insight into the physical and chemical processes of ore deposit formation. These textures are even more insightful when combined with fluid inclusion petrography, ore mineral petrography, trace element analysis, or other analytical methods. ORAL and POSTER

**T14 Modern and Ancient Mineralizing Seafloor Hydrothermal Systems**

*Society of Economic Geologists*

Economic Geology; Marine/Coastal Science; Geochemistry, Other

J. Bruce Gemmell, University of Tasmania, Tasmania, Australia; Cornel E.J. de Ronde, Institute of Geological & Nuclear Sciences, Lower Hutt, New Zealand

Compare modern submarine mineralizing systems in a variety of plate tectonic settings (e.g., back arcs, intra-oceanic

# Call for Papers

and island arcs, seamounts, sediment free ridges, sedimented ridges) to ancient volcanic- and sediment-hosted ore deposits. ORAL

## **T15 Characterizing Complexity in Geomechanics, Engineering Geology, and Hydrogeology**

.....  
*GSA Engineering Geology Division*

Engineering Geology; Hydrogeology; Structural Geology

William C. Haneberg, Haneberg Geoscience, Port Orchard, WA; Edmund Medley, Exponent® Failure Analysis Associates, Menlo Park, CA

Geomechanical and hydrogeological characterization of fault and fracture systems, mélanges, landslides, tills, and other strongly heterogeneous or anisotropic geomaterials. Quantitative probabilistic or process-based modeling contributions, field studies, and laboratory investigations are encouraged. ORAL

## **T16 Deep Rock Slope Deformation: Mechanics, Processes, and Timing**

.....  
*GSA Engineering Geology Division*

Engineering Geology; Quaternary Geology/Geomorphology

James P. McCalpin, Crestone, CO; Stephen G. Evans, Geological Survey of Canada, Ottawa, ON

New advances have been made in the study of deep rock slope deformation (DRSD) by trenching of sackungen in USA and Europe and new discontinuous element models. ORAL and POSTER

## **T17 Advances and Applications of 3-D Fracture Analysis to Rock Mechanics and Engineering Geology**

.....  
*GSA Engineering Geology Division, American Rock Mechanics Association (ARMA); GSA Structural Geology and Tectonics Division*

Engineering Geology; Structural Geology; Hydrogeology

Judy Ehlen, USA Engineer Research and Development Center, Alexandria, VA;

Paul La Pointe, Golder Associates, Inc., Redmond, WA

In this session we propose to bring together those working on these various aspects of 3-D fracture characterization and synthesis to present their current work as it impacts structural geology, engineering geology, and hydrogeology. ORAL

## **T18 Impacts of Hydrostratigraphy on Engineering and Civil Works Projects in the Pacific Northwest**

.....  
*GSA Hydrogeology Division; GSA Engineering Geology Division*

Hydrogeology; Stratigraphy

Richard J. Martin, Shannon & Wilson, Inc., Seattle, WA; Scott W. Gaulke, Shannon & Wilson, Inc., Seattle, WA

This session will provide an opportunity for practitioners to discuss local and regional hydrostratigraphic conditions in the Pacific Northwest including Washington, Oregon, Idaho, and British Columbia. ORAL

## **T19 Biogeochemical and Physical Processes in Mine Pit Lakes**

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*GSA Limnogeology Division*

Geochemistry, Aqueous; Environmental Geoscience; Hydrogeology

Laurie Balistrieri, Seattle, WA; Gina Tempel, Reno, NV; John Crusius, Woods Hole, MA

This session will explore variations in the biogeochemical and physical processes operating in mine pit lakes found in a variety of geological settings and approaches for modeling their water quality as a function of time. ORAL and POSTER

## **T20 Widespread Importance of Immiscible H<sub>2</sub>O-CO<sub>2</sub> Fluids for Petrologic and Geochemical Processes in Low-to-Moderate Temperature Crustal Environments**

.....  
*Geochemical Society*

Geochemistry, Aqueous; Petrology, Metamorphic; Geochemistry, Other

John P. Kaszuba, Los Alamos National Lab, Los Alamos, NM; David R. Janecky, Los Alamos National Lab, Los Alamos, NM

Geochemical reaction models include CO<sub>2</sub> as a major ligand and precipitate, but have generally neglected multiphase fluid implications. This session is intended to explore and contrast the evidence and behavior of high CO<sub>2</sub> natural systems. ORAL and POSTER

## **T21 Geochemistry for Technogenesis**

.....  
Environmental Geoscience; Geochemistry, Aqueous; Geochemistry, Organic

Viktor V. Dolin, Institute for Environmental Geochemistry, Kyiv, Ukraine; Reto Gieré, Purdue University, West Lafayette, IN; James Morris, University of South Carolina, SC

Technogeneous impact on the geochemical media. Biogeochemical cycles of pollutants. Natural attenuation. Human-caused changes of natural isotopic ratios, global carbon cycle. Application of geochemistry for thermodynamic modeling, prediction of man-caused ecosystems development, assessment of health hazards, and countermeasures against pollution. ORAL

## **T22 Working at the Interface of Isotope Geochemistry and Ecology: A Rapidly Growing Discipline (Posters)**

.....  
*GSA Geobiology and Geomicrobiology Division; U.S. Geological Survey*

Environmental Geoscience; Geochemistry, Organic; Geoscience Information/Communication

Adrian Farmer, U.S. Geological Survey, Fort Collins, CO; Elisabeth Brouwers, U.S. Geological Survey, Denver, CO

Biologists and geoscientists are applying stable isotopes to revolutionize ecological studies. These collaborative efforts bring new insights and identify new study areas in both disciplines. This session will focus on cutting-edge techniques and applications to understand current limitations and identify future research priorities and directions. POSTER

**T23 Ecological Stoichiometry: Elemental Cycling and Biogeochemical Interactions in Ecosystem Processes**

*GSA Geobiology and Geomicrobiology Division, U.S. Geological Survey*

Environmental Geoscience; Geochemistry, Other; Geomicrobiology

Elisabeth Brouwers, U.S. Geological Survey, Denver, CO; Jill Baron, U.S. Geological Survey, Fort Collins, CO; Ann Kinsinger, U.S. Geological Survey, Seattle, WA

Ecologists and biogeochemists are using principles of elemental interactions to understand the relationship between organisms and their environment. These relationships are complicated by the impacts of human activities. This session will utilize an element-scale approach to explore the linkages between organisms and their physical environment. ORAL

**T24 On the Forefront of Terrestrial and Marine Organic Geochemistry: A Tribute to John I. Hedges**

*Geochemical Society; American Chemical Society; Geochemical Division*

Geochemistry, Organic; Geochemistry, Other; Paleoclimatology/Paleoceanography

Stephen A. Macko, University of Virginia, Charlottesville, VA; Peggy Ostrom, Michigan State University, East Lansing, MI

This session is held in recognition of the diverse, extensive, and challenging research of John Hedges. ORAL

**T25 Hydrogen in Biogeochemical Systems**

*Geochemical Society, Organic Geochemistry Division*

Geochemistry, Organic; Geomicrobiology; Geochemistry, Aqueous

Michael J. Whiticar, University of Victoria, Victoria, BC; Alex L. Sessions, Woods Hole Oceanographic Institution, Woods Hole, MA

Hydrogen is the most abundant element in organic matter. This session explores

advances in understanding processes, interactions, and systematics associated with the distribution of hydrogen in geomicrobial, biogeochemical, and petroleum systems. Compound-specific measurements of stable hydrogen isotopes by CF-IRMS are particularly emphasized. ORAL

**T26 Computerized Modeling of Petroleum Systems and Paleohydrology**

*Geochemical Society*

Geochemistry, Organic; Hydrogeology; Geochemistry, Aqueous

Kenneth E. Peters, U.S. Geological Survey, Menlo Park, CA; Martin B. Goldhaber, U.S. Geological Survey, Denver, CO

Computerized modeling can be used to reconstruct the temperature and fluid-flow histories of stratigraphic horizons. Our session provides a timely update of concepts and methods for modeling petroleum systems and groundwater or hydrothermal flow. ORAL

**T27 Cutting Edge and "Vintage" Geochemistry: Celebrating the Science and Life of Glenn Goodfriend**

*GSA Quaternary Geology and Geomorphology Division, GSA Archaeological Geology Division; Geochemical Society; Paleontological Society*

Geochemistry, Organic; Quaternary Geology/Geomorphology; Marine/Coastal Science

Bonnie A.B. Blackwell, Williams College, Williamstown, MA; Paul Goldberg, Boston University, Boston, MA; Julie Brigham-Grette, University of Massachusetts, Amherst, MA

To honor Glenn Goodfriend's memory, we will extoll his many interdisciplinary scientific contributions and toast his life. ORAL and POSTER

**T28 Great Ideas for Problem-Based Instruction and Assessment in the Undergraduate Geosciences (Posters)**

*National Association of Geoscience Teachers; GSA Geoscience Education Division*

Geoscience Education

Thomas J. Hollis, Cuesta College and Atascadero High School, San Luis Obispo, CA

Problem-based instruction and assessment involves providing students with basic data and having them develop and analyze the data and provide interpretation. This poster session showcases original, problem-based geoscience exercises. Attending geoscience instructors will be able to gather original, classroom-tested ideas and materials. POSTER

**T29 In Our Own Backyards: Undergraduate Research in a Local Context (Posters)**

*Council on Undergraduate Research, Geosciences Division*

Geoscience Education

Edward C. Hansen, Hope College, Holland, MI; Karen H. Fryer, Ohio Wesleyan University, Delaware, OH

Are there advantages to involving undergraduates in local research problems? What makes such projects successful? How can they be developed and funded? These and similar questions will be addressed in posters highlighting research with a community, campus, or other local emphasis. POSTER

**T30 Large Intro Courses That Work: Sharing Exciting and Effective Teaching Strategies (Posters)**

*National Association of Geoscience Teachers; GSA Geoscience Education Division*

Geoscience Education

Eric Butler, University of Vermont, Burlington, VT; Paul Bierman, University of Vermont, Burlington, VT

Large introductory geoscience courses are a challenge for faculty who wish to make such courses as interesting, relevant, and

# Call for Papers

useful to students as possible. Participants will draw on personal experience and/or educational research to present innovative, effective ways to make large geoscience classes stimulating and worthwhile for students. POSTER

## **T31 Subliminal and Intentional Outreach: Educating the General Public about Geological Sciences Through Novels, Film, TV, and Other Public Media**

.....  
*GSA Geoscience Education Division,  
National Association of Geoscience  
Teachers*

Geoscience Education

Bonnie A.B. Blackwell, Williams College,  
Williamstown, MA

This session will explore how authors and scriptwriters who write major works involving geologists or geological topics, and the people who aid them, research and develop their geological theme. ORAL

## **T32 Using Data to Teach Earth Processes: An Illustrated Community Discussion (Posters). Special Session in Support of the NAGT/DLESE "On the Cutting Edge" Program**

.....  
*National Association of Geoscience  
Teachers*

Geoscience Education

David W. Mogk, Montana State University, Bozeman, MT; Cathryn A. Manduca, Carleton College

Presentations will demonstrate effective use of geoscience data in a variety of instructional settings. All contributions will present learning goals, choice of datasets, tools for accessing and rendering data, evaluation strategies, and example outcome. Those submitting abstracts to this session will have the one-abstract rule waived and will be asked to use a common poster format and to post their work at the "On the Cutting Edge" Web site for broad dissemination. For more information, see <http://serc.carleton.edu/NAGTWorkshops/>. POSTER

## **T33 Beyond Google: Strategies for Developing Information-Literate Geoscience Students (Posters)**

.....  
*National Association of Geoscience  
Teachers*

Geoscience Education; Geoscience Information/Communication

R. Heather Macdonald, College of William and Mary, Williamsburg, VA; Barbara J. DeFelice, Dartmouth College, Hanover, NH; Karen K. Berquist, College of William and Mary, Williamsburg, VA

Information literacy includes both critical assessment and familiarity with resources in many formats, and is a key skill for success in many fields. Geoscience information professionals and faculty share ideas, assignments, instructional approaches, and tools for developing information literacy skills through a course or a curriculum. POSTER

## **T34 Building the Digital Library for Earth System Education (DLESE): New Opportunities for Collaboration**

.....  
*National Association of Geoscience  
Teachers*

Geoscience Education; Geoscience Information/Communication

Ed Geary, Colorado State University, Fort Collins, CO; Rajul Pandya, DLESE Program Center, Boulder, CO

The Digital Library for Earth System Education (DLESE) is a community-led effort that provides access to high-quality digital resources about Earth. This session will describe library development and highlight opportunities for collaboration. ORAL

## **T35 Geoscience Innovation Fostering the Achievement of All Students: Curriculum and Pedagogy Methods Reform, Universal Design Principles, and Applications**

.....  
*GSA Geoscience Education Division;  
Council of Undergraduate Research;  
National Association of Geoscience  
Teachers*

Geoscience Education; Geoscience Information/Communication; Public Policy

Wendi J.W. Williams, University of Arkansas, Little Rock, AR; Roderic Brame, Wright State University, Dayton, OH; Pranoti M. Asher, Georgia Southern University, Statesboro, GA

Most postsecondary schools require completion of laboratory science core courses. This session will bring together geoscientists to explore K-20 curriculum and adaptations through applying universal design principles that make science learning more equitable for all students. ORAL

## **T36 Overcoming Obstacles to Incorporating Experiential Learning into the Undergraduate Geoscience Curriculum**

.....  
*Geoscience Education; Geoscience  
Information/Communication; Public  
Policy*

Robert C. Thomas, University of Montana—Western, Dillon, MT; Sheila M. Roberts

This session will focus on how professors are overcoming obstacles to incorporating experiential learning into the geoscience curriculum. Obstacles may include scheduling, funding, legal issues, student culture, land access, student disabilities, community attitudes, and others. ORAL

## **T37 Teaching Local Geology: A NAGT Session In Honor of Robert Christman**

.....  
*National Association of Geoscience  
Teachers*

Geoscience Education; Geoscience Information/Communication; Public Policy

Andrew Buddington, Spokane Community College, Spokane, WA; Rob Viens, Bellevue Community College, Bellevue, WA

The session invites earth science instructors to present teaching techniques and methods that highlight local geology and geologic history and supplement the broader approach taken by introductory geology textbooks. ORAL



## **T38 Volunteering in K-12 Settings**

*GSA Geoscience Education Division; National Association of Geoscience Teachers*

Geoscience Education; Geoscience Information/Communication; Public Policy

Elizabeth Wright, School of the Art Institute of Chicago, Chicago, IL; William Slattery, Wright State University, Dayton, OH

Most of us are asked occasionally to share our expertise with a K-12 teacher, student, or class in the form of class presentations, field trips, tutoring, judging science fairs, or other activities. We welcome examples of creative volunteer activities and programs that engage K-12 teachers and/or students and that may be exported to other venues. ORAL

## **T39 History and Future of the Relationship Between the Geosciences and Religion: Litigation, Education, Reconciliation?**

*Geoscience Education; History of Geology; Paleontology/Paleobotany*

John F. Bratton, U.S. Geological Survey, Woods Hole, MA

Do you have experience in the evolution-creation wars? This session will examine how they started, major battles, and what hope there is for peace in the near future. Presentations by scientists (religious or not), educators, historians, and theologians are welcome. ORAL and POSTER

## **T40 Workforce and Education: Building the Industry-Academia Connection in Developing a Capable and Sufficient Science and Technology Workforce**

*Geoscience Education; Public Policy; Geoscience Information/Communication*

Marilyn J. Suiter, National Science Foundation, Arlington, VA; Richard M. Taber, National Science Foundation, Arlington, VA

This session will provide information on enrollment and degrees and employment trends in science and technology,

with focus on the geosciences. Exemplary training methods, successful collaborations that lead to workforce-ready graduates, and information on non-traditional employment sectors are also encouraged. ORAL

## **T41 Innovative Approaches to Teaching Sedimentary Geology Courses**

*GSA Geoscience Education Division; GSA Sedimentary Geology Division; National Association of Geoscience Teachers*

*Geoscience Education; Sediments, Clastic; Sediments, Carbonates*

Karen Grove, San Francisco State University, San Francisco, CA; Marjorie A. Chan, University of Utah, Salt Lake City, UT; R. Heather Macdonald, College of William and Mary, Williamsburg, VA

This session will focus on instructional techniques that integrate research advances, innovative pedagogies, and applications to other geoscience fields. Authors may address overall course structure, learning objectives, specific assignments, and/or assessment methods. ORAL and POSTER

## **T42 Enhancing the Earth Science Content Knowledge of Elementary School Teachers**

*National Association of Geoscience Teachers*

*Geoscience Education*

Barbara M. Manner, Duquesne University, Pittsburgh, PA

Most elementary school teachers lack appropriate content knowledge to effectively teach earth science. During this session, professionals will share what they have been doing to enhance the earth science content knowledge of these teachers. ORAL

## **T43 Field and Research Experiences for Students at Two-Year Colleges**

*National Association of Geoscience Teachers*

*Geoscience Education*

Laura Guertin, Penn State University, Delaware County, Media, PA; Prajukti

Bhattacharyya, Saint Louis Community College, Meramec, Saint Louis, MO

Faculty at two-year colleges will discuss ideas and issues in providing a two-year student population with field and research experiences. Submission of abstracts may include, but are not limited to, effective field instruction, logistics of arranging trips with a commuter population, and doing research with a limited pool of geoscience students. ORAL

## **T44 Sigma Gamma Epsilon Student Research (Posters)**

*Sigma Gamma Epsilon*

*Environmental Geoscience*

Donald W. Neal, East Carolina University, Greenville, NC; Charles J. Mankin, Oklahoma Geological Survey, Norman, OK

All students are welcome to submit posters on their research on any aspect of geology. POSTER

## **T45 Geological and Geophysical Databases: What We Have and What We Need**

*GSA Geophysics Division, GSA Structure and Tectonics Division*

*Geoscience Information/Communication; Geophysics/Tectonophysics/Seismology; Remote Sensing/Geographic Info System*

G. Randy Keller, University of Texas, El Paso, TX; J. Douglas Walker, University of Kansas, Lawrence, KS

The recognition of the complexity of the questions that our community faces has dictated that we create a data system to facilitate sharing and integration of diverse data. This session focuses on the first step in this process, which is understanding the status of existing databases and identifying data that have yet to be crafted into databases. ORAL

## **T46 Challenges in Geoscience Publishing: The Insiders' Perspectives**

*Association of Earth Science Editors (AESE)*

*Geoscience Information/Communication; Geoscience Education; Public Policy*

# Call for Papers

Monica G. Easton, Ontario Geological Survey, Sudbury, ON; Carol L. Ruthven, Kentucky Geological Survey, Lexington, KY

Presenters will discuss issues that authors, reviewers, and editors confront in publishing geoscientific manuscripts (e.g., intellectual property rights, copyright retention, confidentiality, conflicts of interest, plagiarism, fraud, "salami" publishing, electronic publication, manuscript review quality, reviewer overload, etc.) and offer solutions. ORAL

## **T47 Design and Development of XML-based, Discipline-Specific, Geological Markup Languages, and Development of Applications (with Object-oriented Languages) and Databases to Process, Store, and Interchange Geological Data over the Web**

Geoscience Information/Communication; Remote Sensing/Geographic Info System; Structural Geology

Hassan A. Babaie, Georgia State University, Atlanta, GA; Rahul Ramachandran, University of Alabama, Huntsville, AL

The session will cover techniques of developing markup languages applying the XML specifications in different fields of geosciences, e.g., TectonicsML, SedML, StratML, SeismML, GeochemML, and for the whole geology (GeoML). ORAL and POSTER

## **T48 Geoscience Information Horizons: Challenges, Choices, and Decisions**

Geoscience Information Society

Geoscience Information/Communication

Lura E. Joseph, University of Illinois at Urbana-Champaign, IL; Joanne Lerud-Heck, Colorado School of Mines, Golden, CO

Geoscience information professionals are confronted with challenges and opportunities in all areas, including collections and use of collections. New technologies present a variety of choices, and the decisions made will affect geology collections and information users now and far into the future. ORAL and POSTER

## **T49 The National Geologic Map Database (Posters)**

U.S. Geological Survey; Association of American State Geologists

Geoscience Information/Communication

David R. Soller, U.S. Geological Survey, Reston, VA; Thomas M. Berg, Ohio Geological Survey, Columbus, OH

The National Geologic Map Database (<http://ncgmp.usgs.gov/ngmdbproject/>) is a Congressionally mandated effort. This session will focus on collaborative USGS-state geological survey advances in digital mapping, standards (map symbolization, data model, science language), and map databases being conducted under the aegis of this project. POSTER

## **T50 Henry Darcy's 200th Birthday: Fundamental Advancements Through Observation and Analysis**

GSA Hydrogeology Division; National Ground Water Association; GSA History of Geology Division; History of Earth Science Society (HESS)

Hydrogeology; Engineering Geology; History of Geology

Vicki J. Kretsinger Grabert, Luhdorff and Scalmanini, Consulting Engineers/AGWSE (NGWA), Woodland, CA; Graham E. Fogg, University of California, Davis, CA

This session will honor Henry Darcy, his research approach, and his profound Law. Planned presentations include a historical perspective of his accomplishments and recent, observation-based research that will fundamentally change our understanding of groundwater flow and mass transport phenomena and help identify future research needs. ORAL

## **T51 M. King Hubbert at 100: The Enduring Contributions of Twentieth-Century Geology's Renaissance Man**

GSA Hydrogeology Division, National Ground Water Association; U.S. National Chapter of the International Association of Hydrogeologists; GSA Geophysics Division; GSA Sedimentary Geology Division; GSA Structural Geology and

Tectonics Division; GSA History of Geology Division

Hydrogeology; Structural Geology; History of Geology

Alan E. Fryar, University of Kentucky, Lexington, KY; T.N. Narasimhan

M. King Hubbert (1903–1989) made fundamental contributions to structural geology, tectonics, hydrogeology, and petroleum geology. He forecast the decline in worldwide petroleum reserves and advanced the development of geology as a quantitative discipline. This session explores Hubbert's legacy as scientist, educator, citizen, and visionary. ORAL

## **T52 Twenty Years of Exploration and Innovation in Quantitative Hydrogeology: In Honor of Ed Sudicky**

GSA Hydrogeology Division

Hydrogeology

Rene Therrien, Universite Laval, Quebec, QC; Motomu Ibaraki, Ohio State University, Columbus, OH

Since obtaining a Ph.D. in hydrogeology in 1983, Ed Sudicky has conducted innovative research on topics such as multiphase flow, stochastic analysis in heterogeneous and fractured media, coupled surface/groundwater flow and contaminant migration in hydrologic systems. We are soliciting talks on the state of the science of these and related topics. ORAL

## **T53 Watershed-Based Research and Education: The State of the Science**

GSA Hydrogeology Division; GSA Geoscience Education Division; GSA Quaternary Geology and Geomorphology Division; Geochemical Society

Hydrogeology; Environmental Geoscience; Quaternary Geology/Geomorphology

Rachel O'Brien, Allegheny College, Meadville, PA; Christopher J. Woltemade, Shippensburg University of Pennsylvania, Shippensburg, PA

We seek a diverse group of scientists and watersheds studied for the session. Topics for consideration include innovations in

field methods, data collection and management, watershed monitoring, and/or research findings. Abstracts related to undergraduate education are also encouraged. ORAL

**T54 Geochemical Modeling of Arsenic Speciation, Transformation, and Reactive Transport in Groundwater**

.....  
GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Geomicrobiology

Chen Zhu, University of Pittsburgh, Pittsburgh, PA; Robert Ford, U.S. Environmental Protection Agency, Ada, OK

Contributions are sought for all aspects of arsenic geochemical modeling in groundwater, including thermodynamic database revisions, modeling sorption to aquifer solids, modeling redox reaction dynamics, and field applications of geochemical models. ORAL

**T55 Groundwater and Watershed Analysis Across Political Boundaries**

.....  
GSA Hydrogeology Division

Hydrogeology; Public Policy; Environmental Geoscience

Barry J. Hibbs, California State University, Los Angeles, CA; Dave Rudolph

Many aquifers and surface watersheds underlie and cross geopolitical boundaries. This session examines specific issues of transboundary water resources, including successful strategies and impediments in technical case studies, security, management, and modeling. ORAL

**T56 Recent Advances in Outcrop-Aquifer Analog Studies: Insights from Geophysical, Geostatistical, and Modeling Techniques**

.....  
GSA Hydrogeology Division

Hydrogeology; Stratigraphy; Environmental Geoscience

Andrew C. Muller, Millersville University, Millersville, PA

Insights from geophysical, geostatistical, and modeling efforts will be presented as they apply to outcrop-analog studies in heterogeneous porous media from various depositional environments. ORAL and POSTER

**T57 The Role of Diffusion in Groundwater Contaminant Behavior**

.....  
GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience

Matthew W. Becker, University at Buffalo, Buffalo, NY; Beth Parker, University of Waterloo, Waterloo, ON

The role of molecular diffusion in contaminant behavior may be different in consolidated and unconsolidated dual-porosity media, but the transport mechanisms are similar. We encourage interaction of researchers working in heterogeneous sediments and fractured rocks and clay. We especially solicit

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# Call for Papers

contributions involving field or laboratory data. ORAL and POSTER

## **T58 Saturated and Vadose Zone Hydrogeology, Environmental Geology, and Biogeochemistry of the Department of Energy Hanford Site in Southeastern Washington State**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Environmental Geoscience; Engineering Geology

Timothy D. Scheibe, Pacific Northwest National Lab, Richland, WA; Christopher J. Murray, Battelle Pacific Northwest National Lab, Richland, WA; Andy L. Ward, Pacific Northwest National Lab, Richland, WA

This session will explore Hanford Site geology as the setting for complex hydrologic, geochemical, and microbiological processes that influence the fate, transport, and remediation of radiological and hazardous wastes in the vadose zone and groundwater. ORAL and POSTER

## **T59 Pharmaceuticals and Emerging Organic Contaminants in the Hydrologic Environment: Progressing from Occurrence to Fate and Effects**

.....  
*GSA Hydrogeology Division; Toxic Substances Hydrology Program, Water Resources Discipline, U.S. Geological Survey*

Hydrogeology; Environmental Geoscience; Limnogeology

Edward T. Furlong, U.S. Geological Survey, Denver, CO; Dana W. Kolpin, U.S. Geological Survey, Iowa City, IA

The study of pharmaceuticals and other organic wastewater contaminants is advancing beyond simple descriptive studies and detailed investigations of the transport, fate, and effects of these compounds are underway by many research groups. The presentations in this session provide a state-of-the-science overview for this exciting research area. ORAL

## **T60 Transport and Remediation of Organic Compounds in the Saturated Zone**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Geochemistry, Organic; Environmental Geoscience

Thomas B. Boving, University of Rhode Island, Kingston, RI; John E. McCray, Colorado School of Mines, Golden, CO

Transport, fate, and remediation of organic contaminants in groundwater systems has been the focus of intense research over the past decade. This session will focus on recent advances and elucidates the fundamental physics and chemistry associated with these processes. ORAL and POSTER

## **T61 Springs: Interactions of Physical, Chemical, Biological, and Cultural Systems**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Environmental Geoscience; Engineering Geology

Abe Springer, Northern Arizona University, Flagstaff, AZ; Susan Swanson, Beloit College, Beloit, WI

Springs support immense biological diversity and are important for traditional uses by various cultures. We encourage submissions of recent research into the physical and chemical understanding of springs and the interactions between springs and their dependent biological and cultural systems. ORAL and POSTER

## **T62 Flow and Biogeochemical Processes at the Interface Between Surface Water and Groundwater**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Geochemistry, Aqueous; Marine/Coastal Science

Donald O. Rosenberry, U.S. Geological Survey, Lakewood, CO; Masaki Hayashi, University of Calgary, Calgary, AB

Research on the interaction between surface water and groundwater will be presented from a broad range of physical settings and scientific disciplines. Topics will include hydrological and biogeochemical processes, measurement methods, and results from mathematical modeling. ORAL

## **T63 Exploring the Linkages Between the Geochemistry, Biology, and Hydrology of the Hyporheic Zone (Posters)**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Geochemistry, Aqueous; Quaternary Geology/Geomorphology

Eric W. Peterson, Illinois State University, Normal, IL; Toby Dogwiler, Winona State University, Winona, MN

An interdisciplinary session designed to synthesize and expose concepts of hyporheic zone, focusing on the "exchange flows" that link the geochemistry, biology, and hydrology of the stream with the substrate forms of the hyporheic zone. POSTER

## **T64 How Subsurface Properties Determine Microbial Habitats: The Role of Groundwater Flow and Subsurface Chemistry in Supplying Energy and Nutrients to the Subsurface Biosphere**

.....  
*GSA Hydrogeology Division, International Association of Hydrogeologists/U.S. National Chapter; GSA Geobiology and Geomicrobiology Division*

Hydrogeology; Geomicrobiology; Geochemistry, Aqueous

Barbara Bekins, U.S. Geological Survey, Menlo Park, CA; Phillip Bennett, University of Texas, Austin, TX

This session will examine the role of groundwater flow and subsurface chemistry in supplying energy and nutrients to the subsurface biosphere. Microbial habitats both in the terrestrial subsurface and below the seafloor and their relationship to subsurface properties are of interest. ORAL and POSTER

## **T65 Evolution and Migration of Brines in Sedimentary Basins**

.....  
*GSA Hydrogeology Division, Society of Economic Geologists*

Hydrogeology; Geochemistry, Aqueous; Economic Geology

Alicia M. Wilson, University of South Carolina, Columbia, SC; Benjamin J. Rostron, University of Alberta, Edmonton, AB

Brines hold clues to often complex paleo-hydrologic and geochemical histories and provide an important approach for studies of long-term transport in sedimentary basins. We seek contributions that explore the geochemical evolution, migration, and distribution of brines in modern and ancient basins from hydrogeologic and geochemical standpoints. ORAL and POSTER

**T66 Karst Hydrology and Geomorphology in North America Over the Past Half Century: In Honor of Derek Ford and William White**

.....  
*GSA Hydrogeology Division; GSA Quaternary Geology and Geomorphology Division; Karst Waters Institute*

Hydrogeology; Quaternary Geology/Geomorphology

Carol M. Wicks, University of Missouri, Columbia, MO; Russell S. Harmon, U.S. Army Research Office, Durham, NC

For 50 years, sustained pioneering work by Derek Ford and Will White has guided North American research in karst hydrology and geomorphology. This session honors their scientific contributions by presenting current research results and new research directions. ORAL and POSTER

**T67 Hydrogeologic Analysis of Glaciated Terrains**

.....  
*GSA Hydrogeology Division; GSA Engineering Geology Division*

Hydrogeology; Quaternary Geology/Geomorphology; Engineering Geology

John J. Quinn, Argonne National Lab, Argonne, IL; M. Jim Hendry, University of Saskatchewan, Saskatoon, SK

Characterizing complex glacial deposits poses a challenge in analyses of groundwater contamination and water resources. Field, lab, and computer techniques to characterize and model the hydrogeology of glaciated terrains are presented. ORAL

**T68 Quaternary Stratigraphy and Implications for Water Resources in the Pacific Northwest**

.....  
*U.S. Geological Survey; Washington Water Science Center; GSA Hydrogeology Division*

Hydrogeology; Quaternary Geology/Geomorphology; Environmental Geoscience

Sue Culton Kahle, U.S. Geological Survey, Tacoma, WA; Christopher P. Konrad, U.S. Geological Survey, Tacoma, WA

Advances in Quaternary stratigraphic knowledge and applied hydrogeology will be shared by participants in order to further the advancement of hydrogeologic sciences related to the Quaternary deposits in the Pacific Northwest. ORAL and POSTER

**T69 Characterization of Brackish and Saline Aquifer Systems**

.....  
*GSA Hydrogeology Division; U.S. Geological Survey*

Geochemistry, Aqueous; Hydrogeology

Norman Grannemann, U.S. Geological Survey, Lansing, MI; Alan Burns, U.S. Geological Survey, Lakewood, CO

This session addresses the hydrogeology of saline and brackish aquifers, the geochemistry of water in those systems, the effects of withdrawing saline water for desalting, and disposal of brine associated with the desalting process. ORAL

**T70 Heterogeneity in Sedimentary Aquifers: Challenges for Characterization and Flow Modeling**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Sediments, Carbonates; Sediments, Clastic

Timothy T. Eaton, Wisconsin Geological and Natural History Survey, Madison, WI; Kenneth R. Bradbury, Wisconsin Geological and Natural History Survey, Madison, WI

Many groundwater settings do not have the homogeneous, isotropic conditions often assumed in sedimentary aquifers. This session will bring together hydrogeologic characterization and flow model-

ing work in complex environments such as heterogeneous unlithified material, carbonate and clastic bedrock, karst, and fractured or faulted settings. ORAL

**T71 Hydrogeology of Volcanic Arcs**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Volcanology

Michael Manga, University of California, Berkeley, CA; Timothy Rose, Lawrence Livermore National Lab, Livermore, CA

Many of the unusual hydrologic systems and processes in volcanic arcs result indirectly from active magmatism. Magmatic activity affects both hydrogeologic properties and the range of temperatures at which water-rock interactions occur. We welcome submissions dealing with the full spectrum of temperature, depth, and time scales. ORAL and POSTER

**T72 A Century of Hydrogeologic Investigations and Groundwater Modeling in the Great Basin: What Have We Learned?**

.....  
*GSA Hydrogeology Division; U.S. Geological Survey*

Hydrogeology; Structural Geology; Tectonics

Wayne R. Belcher, U.S. Geological Survey, Henderson, NV; Donald S. Sweetkind, U.S. Geological Survey, Denver, CO

What have we learned about the hydrogeology of this region and how are these data used to model the groundwater system? We welcome presentations that provide historical perspective and recent advances on understanding the hydrogeologic system of this important region that includes the Nevada Test Site and Yucca Mountain. ORAL

**T73 The Integration of Measurements and Modeling in the Hydrological Sciences**

.....  
*GSA Hydrogeology Division*

Hydrogeology; Engineering Geology; Remote Sensing/Geographic Info System

Kellie B. Vache, Oregon State University, Corvallis, OR; Jeffrey J. McDonnell, Oregon State University, Corvallis, OR

# Call for Papers

This session will focus the utilization of measurements in modeling exercises, introduction of new model structures that better facilitate the use of measurements, or exploration of the role of numerical experiments and/or GIS in increasing the dialogue between experimentalist and modeler. ORAL and POSTER

## **T74 Revolutionizing Ocean Science: Cabled Observatories on the North American Pacific Coast**

Marine/Coastal Science

John Delaney, University of Washington, Seattle, WA; Christopher Barnes, University of Victoria, Victoria, BC

The ocean sciences are entering a new era through the deployment of powered, fiber-optic cabled observatories that will provide real-time data and decadal time series. This session will consider the scientific, technological, and educational opportunities offered by three

observatory projects under way on the Pacific margin of North America. ORAL

## **T75 Human Versus Natural Influences on Holocene Sedimentation in Estuaries, Harbors, and Marginal Marine Ecosystems**

Society for Sedimentary Geology

Marine/Coastal Science; Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Douglas W. Haywick, University of South Alabama, Mobile, AL; Miriam L. Fearn, University of South Alabama, Mobile, AL

This session will focus on the sedimentology and ecology of Recent deposits within marginal marine environments. In particular, it will bring together researchers examining human-induced and natural influences on Holocene sediment fill within these important ecosystems. ORAL and POSTER

## **T76 Present Posture and Future Status of Pacific Atoll Research**

GSA International Division

Sediments, Carbonates; Environmental Geoscience; Marine/Coastal Science

John D. Collen, Victoria University of Wellington, Wellington, New Zealand; Douglas Edsall, U.S. Naval Academy, Annapolis, MD

This session will examine the current state of knowledge of sedimentary and biological systems of Pacific atolls and discuss the additional information needed to support future management of atoll environments. Atolls in the Pacific, as elsewhere, are threatened by overpopulation, development, pollution, and global environmental change. ORAL and POSTER

## **T77 Coastal Processes and Hazards Along Active Margin and Low Latitude Coasts**

GSA Engineering Geology Division

*Lane*

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Marine/Coastal Science; Quaternary Geology/Geomorphology; Environmental Geoscience

Cheryl J. Hapke, U.S. Geological Survey, Santa Cruz, CA; Laura J. Moore, Oberlin College, Oberlin, OH

This session will focus on the latest developments in our understanding of active margin and low latitude coastal processes and hazards, as well as effective mitigation strategies. ORAL and POSTER

**T78 Gas Hydrate in the Natural Environment and Implications for Energy Resources, Seafloor Stability, Climate, and the Biology of the Deep Sea (Posters)**

Marine/Coastal Science; Environmental Geoscience; Engineering Geology

William P. Dillon, U.S. Geological Survey, Woods Hole, MA; Timothy S. Collett, U.S. Geological Survey, Denver, CO; Deborah R. Hutchinson, U.S. Geological Survey, Woods Hole, MA

This session will emphasize recent concepts and field results regarding mechanisms of concentration of gas hydrate, control of landslides, contribution of methane to the atmosphere, implications for vent biota, and general characterization of natural gas hydrate. POSTER

**T79 Biogeochemical Processes at Ancient and Modern Methane Seeps**

*Burke Museum of Natural History and Culture*

Marine/Coastal Science; Paleoclimatology/Paleoceanography; Paleontology/Paleobotany

Joern Peckmann, Research Center for Ocean Margins, University of Bremen, Bremen, Germany; James L. Goedert

Numerous hydrocarbon-seep deposits have been reported from Recent and Cenozoic strata, and relatively few Mesozoic and Paleozoic deposits have been recognized. Distinctive carbonate fabrics, stable isotope signatures, and biomarker patterns are diagnostic for biogeochemical processes at ancient seep sites. ORAL

**T80 The Impact of Crystal Chemistry in the Earth Sciences: A Tribute to Charles T. Prewitt, Recipient of the 2003 Roebling Medal of the Mineralogical Society of America**

*Mineralogical Society of America*

Mineralogy/Crystallography

Nancy L. Ross, Virginia Tech, Blacksburg, VA; Russell J. Hemley, Carnegie Institution of Washington, Washington, D.C.; Ross J. Angel, Virginia Tech, Blacksburg, VA

A session to celebrate the fundamental contributions of Charles T. Prewitt, the 2003 Roebling Medallist of the Mineralogical Society of America, to the fields of crystallography, crystal chemistry, mineralogy, and mineral physics. ORAL and POSTER

**T81 Multi-Proxy Terrestrial Records and the Ocean-Climate System: Links and Perturbations in the Cretaceous**

Paleoclimatology/Paleoceanography; Geochemistry, Other; Paleontology/Paleobotany

David B. Finkelstein, Indiana University, Bloomington, IN; Darren R. Gröcke, Royal Holloway University of London, Egham, Surrey, UK; Lisa M. Pratt, Indiana University, Bloomington, IN

Topics concerning the geochemical signature of botanical, pedogenic, and lacustrine materials, terrestrial-marine correlations, terrestrial biotic response to atmospheric and oceanic change, and the record of pCO<sub>2</sub> and climate in the Cretaceous are encouraged. ORAL and POSTER

**T82 Ocean Chemistry Through the Mesozoic and Cenozoic**

*Geochemical Society*

Paleoclimatology/Paleoceanography; Geochemistry, Other

Adina Paytan, Stanford University, Stanford, CA

There is considerable evidence that the chemical composition of the ocean has

changed over the past 550 m.y. These changes relate to changes in the global biogeochemical cycles. New research in this field will be presented. ORAL and POSTER

**T83 Reevaluating the Equatorial Temperature Paradox for Mesozoic and Cenozoic Warm Episodes**

Paleoclimatology/Paleoceanography; Geochemistry, Other; Stratigraphy

Timothy S. White, U.S. Geological Survey, Anchorage, AK; David Pollard, Pennsylvania State University, University Park, PA; Chris Poulsen, University of Southern California Earth Sciences, Los Angeles, CA

During past warm episodes, many proxy data indicate greater warming at high latitudes than at low latitudes. This thermal gradient cannot be sustained in climate models by increased CO<sub>2</sub> alone. We will address the paradox using a combined data-modeling approach. ORAL and POSTER

**T84 Pliocene Climates—Sea Levels and Ice Volumes (Posters)**

Paleoclimatology/Paleoceanography

Detlef A. Warnke, California State University, Hayward, CA; Lloyd Burckle, Lamont-Doherty Earth Observatory, Palisades, NY

Abstracts are encouraged on all aspects of Pliocene climate research, including field work on all continents and marine research in all oceans. Participation by students is encouraged. POSTER

**T85 Signs of Life: the Role of Paleobiology in the History of Evolutionary Theory and our Attempts to Understand the Changing Nature of the Biosphere**

*GSA History of Geology Division; Paleontological Society; Society of Vertebrate Paleontology; Cushman Foundation; History of Earth Science Society (HESS)*

History of Geology; Paleontology/Paleobotany; Geomicrobiology

# Call for Papers

Roger D.K. Thomas, Franklin & Marshall College, Lancaster, PA; Gary D. Rosenberg, Indiana University-Purdue University, Indianapolis, IN

Fossils are static, inanimate objects. This session will explore the ways in which they have been brought to life. Studies of earlier work, not originally characterized as paleobiology, will set the stage for a critical assessment of 20th century paleobiology. ORAL

## **T86 Fossil Decapod Crustacean Paleobiogeography, Systematics, and Evolution Over the Past 20 Years: In Honor of Ross and Marion Berglund (Posters)**

*Paleontological Society, Paleontology Society*

Paleontology/Paleobotany

Elizabeth Nesbitt, Burke Museum, Seattle, WA; Torrey G. Nyborg, Loma Linda University, Loma Linda, CA

Fossil decapod crustaceans collected and donated by Ross and Marion Berglund have yielded a number of new taxa from the Pacific Northwest of North America, immensely adding to our knowledge of fossil decapod crustacean paleobiogeography, systematics, and evolution. POSTER

## **T87 Paleo-Plant Ecophysiology**

*Paleontological Society*

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Environmental Geoscience

Dana L. Royer, Pennsylvania State University, University Park, PA; Christopher J. Williams, University of Pennsylvania, Philadelphia, PA

Recent advances in paleo-plant ecophysiology have sharpened our understanding of ancient terrestrial ecosystems and climates. This session will focus on studies that provide mechanistic linkages between plant physiology, ecology, and climate. ORAL

## **T88 The Hunt for Precambrian Life: An Integrated Approach**

*Paleontological Society, GSA Geobiology and Geomicrobiology Division; Precambrian (at large)*

Paleontology/Paleobotany; Geomicrobiology; Precambrian Geology

David J. Bottjer, University of Southern California, Los Angeles, CA; J. William Schopf, University of California, Los Angeles, CA

Detection of Precambrian life is a strong focus of attention for earth and biological scientists. This session centers on the latest advances in methods used for, and results of, searches for evidence of such ancient life, as shown by studies of fossils, sedimentary structures of biologic origin, and isotopic and organic geochemical data. ORAL and POSTER

## **T89 Evolutionary and Ecological Links Between Terrestrial and Marine Ecosystems in the Phanerozoic**

*Paleontological Society*

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geochemistry, Other

Wolfgang Kiessling, Humboldt University, Berlin, Germany; Allister Rees, University of Chicago, Chicago, IL

This session will focus on large-scale ecological and evolutionary patterns in Phanerozoic terrestrial and marine environments. The ecological links between terrestrial and marine ecosystems are explored using paleontological, sedimentological, geochemical, and modeling approaches. ORAL

## **T90 Terrestrial Paleobiology of South America, Cretaceous through Neogene**

*Paleontological Society*

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Sediments, Clastic

Peter Wilf, Pennsylvania State University, University Park, PA; Robyn J. Burnham, University of Michigan, Ann Arbor, MI; Maria A. Gandolfo, Cornell University, Ithaca, NY; Kirk R. Johnson, Denver

Museum of Nature & Science, Denver, CO

Topics may include the evolution of South American biological diversity and ecosystems, biogeographic relationships, differences between Cretaceous and Paleogene biotas, biostratigraphy, and response to climate change, uplift, invasion, and other disturbances. ORAL and POSTER

## **T91 Understanding Late Devonian Biotic, Climatic, and Oceanographic Events: Toward an Integrated Approach**

*Paleontological Society*

Paleontology/Paleobotany; Geochemistry, Other; Paleoclimatology/Paleoceanography

Jared R. Morrow, University of Northern Colorado, Greeley, CO; Paul B. Wignall, University of Leeds, Leeds, UK; D. Jeffrey Over, State University of New York, Geneseo, NY

This multidisciplinary session will examine the dynamic Late Devonian interval, which was marked by dramatic fluctuations in sea level, ocean oxygenation, stable isotopic ratios, and global biodiversity, accompanied by accelerated terrestrialization and multiple bolide impacts. ORAL

## **T92 Advances in the Fossil Record of Insects and Other Terrestrial Arthropods**

*GSA Geobiology and Geomicrobiology Division; Paleontological Society; Paleontological Research Institute*

Paleontology/Paleobotany; Coal Geology; Paleoclimatology/Paleoceanography

Cary Easterday, Ohio State University, Columbus, OH; Conrad Labandeira, Smithsonian Institute, Washington, D.C.

A session to bring together those working on, and those interested in, the body and trace fossil record of the dominant animal phylum on dry land. ORAL and POSTER



## **T93 Micropaleontological Proxies of Ocean Gateway Paleooceanography**

.....  
*Cushman Foundation*

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geochemistry, Other

Stephen A. Nathan, University of Massachusetts, Amherst, MA; R. Mark Leckie, University of Massachusetts, Amherst, MA

Ocean gateways such as the Drake Passage, Central American Seaway, and the Indonesian Seaway have altered ocean circulation, directly affecting ocean heat transport, and in turn, climate. This session will provide the opportunity to exchange and discuss new results and ideas about ocean gateway paleoceanography based on micropaleontological proxies. ORAL and POSTER

## **T94 Bridging the Gap: Ostracodes in the Earth Sciences**

.....  
*Paleontological Society; GSA  
Limnogeology Division*

Paleontology/Paleobotany; Quaternary Geology/Geomorphology; Hydrogeology

Gene Hunt, University of Chicago, Chicago, IL; Lisa E. Park, University of Akron, Akron, OH

This session emphasizes new, interdisciplinary advances in ostracode research. Talks will span paleontology, molecular biology, hydrogeology, paleoclimatology, and paleolimnology. Speakers will emphasize applied approaches using this important group, to solve different problems in a broad diversity of disciplines within the earth sciences. ORAL

## **T95 Organic Carbon in Lake Systems: From Primary Production to Oil Production**

.....  
*GSA Limnogeology Division*

Limnogeology; Geochemistry, Organic; Quaternary Geology/Geomorphology

Kevin Bohacs, ExxonMobil Upstream Research Co., Houston, TX; Thomas C. Johnson, University of Minnesota, Duluth, MN

Lacustrine basins account for about 20% of today's supply of oil and natural gas,

yet little dialogue occurs between limnologists who study processes that control carbon production in modern large lakes and geologists who exploit ancient lacustrine systems for oil and gas. This session aims to bring these two groups of scientists together. ORAL

## **T96 Lakes and Holocene Environmental Change: The Use of Multiproxy Lake Records for Paleoclimate Reconstructions**

.....  
*GSA Limnogeology Division*

Limnogeology; Paleoclimatology/Paleoceanography; Quaternary Geology/Geomorphology

Mark Abbott, University of Pittsburgh, Pittsburgh, PA; Andrea Lini, University of Vermont, Burlington, VT

This session is aimed at demonstrating the strength of multiproxy approaches to Holocene climate reconstruction from lake sediment records. ORAL and POSTER

## **T97 Who Needs Carbon: Innovative Applications of Alternative Quaternary Geochronology Methods (Posters)**

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Quaternary Geology/Geomorphology; Archaeological Geology

Kenneth Lepper, Los Alamos National Lab, Los Alamos, NM; Andrew Ivester, State University of West Georgia, Carrollton, GA

A spectrum of absolute dating techniques and relative geochronologic methods are now available to Quaternary scientists. This session aims to highlight the diversity and versatility of chronologic tools, other than radiocarbon, by emphasizing recent technique advances and innovative applications studies. POSTER

## **T98 Interhemispheric Records of Paleoclimate Change: Low Latitude Influences on the High Latitudes, or the Other Way Around, in Pole-Equator-Pole Syntheses**

.....  
*GSA Quaternary Geology and  
Geomorphology Division; International*

*Geosphere/Biosphere Program—Past Global Changes*

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Limnogeology

Vera Markgraf, University of Colorado, Boulder, CO; Julie Brigham-Grette, University of Massachusetts, Amherst, MA

Emerging evidence and modeling now suggest the tropics may drive the climate system on a variety of time scales. This session encourages evolving ideas aimed at pole-equator-pole comparisons of Quaternary oceanographic and terrestrial proxy records. ORAL and POSTER

## **T99 Soils and a Sustainable Future—The Neglected Challenge in Geology: A Tribute to the Many Contributions and Challenges of Aldo Leopold**

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*GSA Geology and Public Policy  
Committee; U.S. National Committee for  
the Geological Sciences; Geological  
Association of Canada; Canadian Society  
of Soil Science*

Public Policy; Environmental Geoscience; Quaternary Geology/Geomorphology

Paul H. Reitan, University at Buffalo, Buffalo, NY; Ward Chesworth

This session will examine soil function in the ecosphere and its role in maintaining human societies: ecological overview; human activity and soil function—from first agriculture to present modern industrialized agriculture; paleosols and climate change; a vision of farming in N. America; and application of science in the sociopolitical arena. ORAL

## **T100 Wetland Science: Intersection of Hydrogeology, Geomorphology, Ecology, and Computer Modeling**

.....  
*GSA Hydrogeology Division; USDI—  
Geological Survey; Montana State  
University*

Hydrogeology; Quaternary Geology/Geomorphology; Environmental Geoscience

# Call for Papers

Richard S. Sojda, USDI—Geological Survey, Bozeman, MT; Brian L. McGlynn, Montana State University, Bozeman, MT; Donald O. Rosenberry, U.S. Geological Survey, Lakewood, CO

We will explore the intersection of geologic disciplines that contributes to an understanding of wetland ecology. Papers should focus on integrative methodologies and might explore wetland geomorphology, soils, landscape hydrology, hydroperiods, plant and wildlife communities, and computer modeling. ORAL

## **T101 Erosion, Exhumation, and Uplift: Complex Interactions and Feedback Mechanisms Between Tectonics and Geomorphology**

.....  
*GSA Quaternary Geology and Geomorphology Division; GSA Structural Geology and Tectonics Division*

Quaternary Geology/Geomorphology; Tectonics; Remote Sensing/Geographic Info System

Kurt L. Frankel, Lehigh University, Bethlehem, PA; Bernard Guest, University of California, Los Angeles, CA

This session will investigate complex links and feedback mechanisms associated with fluvial and glacial erosion and orogenic processes from a multidisciplinary approach. The necessary thresholds needed for these interactions will be a primary focus. ORAL and POSTER

## **T102 Geological Mapping: Key to Successful Management of Water and Land Resources (Posters)**

.....  
*GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division; GSA Engineering Geology Division; U.S. Geological Survey; Association of American State Geologists*

Quaternary Geology/Geomorphology; Hydrogeology; Environmental Geoscience

Richard C. Berg, Illinois State Geological Survey, Champaign, IL; Peter T. Lyttle, U.S. Geological Survey, Reston, VA; Harvey Thorleifson, Geological Survey of Canada, Ottawa

Geological mapping is a key to environmental protection and management of water and land resources. This session will highlight innovative mapping products that are being used by an increasingly broad range of users. POSTER

## **T103 Comprehensive Landscape Analysis—A Predictive Tool for Mapping Surficial Deposits and Their Environmental Attributes**

.....  
*GSA Sedimentary Geology Division*

Quaternary Geology/Geomorphology; Stratigraphy; Environmental Geoscience

Kathleen M. Farrell, Raleigh, NC; C. William Zanner, University of Nebraska, Lincoln, NE

This session will cover research that integrates predictive, geomorphic maps derived from electronic spatial data (GIS); subsurface investigations intended to map surficial sedimentary facies; and environmental attributes such as geologic processes, hazards, hydrologic characteristics, or geochemical signatures. ORAL and POSTER

## **T104 “Noah’s Flood” and the Late Quaternary Geological and Archaeological History of the Black Sea and Adjacent Basins**

.....  
*Avalon Institute of Applied Science*

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Archaeological Geology

Valentina Yanko-Hombach, Avalon Institute of Applied Science, Winnipeg, MB; Jim Teller, University of Manitoba, Winnipeg, MB

New data on the Late Quaternary geology and archaeology of the Black Sea and adjacent basins will be presented, and the hypothesized link of Noah’s Flood to the Black Sea basin will be discussed. ORAL

## **T105 Ecological Implications of Headwater Channel Processes**

.....  
Environmental Geoscience; Quaternary Geology/Geomorphology

Michael K. Liquori, University of Washington, Seattle, WA

In this session, we will explore the relationship between hydrology, geomorphology, and ecology, particularly as it may guide land-use management. Authors seeking to express conceptual ideas, theoretical musings, and/or detailed analyses of data are encouraged to submit abstracts to this highly interdisciplinary discussion. ORAL and POSTER

## **T106 Quaternary History and Stratigraphy of the Pacific Northwest**

.....  
Quaternary Geology/Geomorphology

Kathy Goetz Troost, University of Washington, Seattle, WA; Tim Walsh, Washington Division of Geology, Olympia, WA; Ralph Haugerud, University of Washington, Seattle, WA

This session seeks to present the latest findings of research on the Quaternary history and stratigraphy of the Pacific Northwest, including chronology, paleontology, magnetostratigraphy, Quaternary deformation, landscape development, glacial processes and deposition, provenance studies, and geologic mapping. ORAL and POSTER

## **T107 Records of Quaternary Landscape Change in the Rocky Mountains**

.....  
*GSA Quaternary Geology and Geomorphology Division*

Quaternary Geology/Geomorphology

Benjamin J.C. Laabs, University of Wisconsin, Madison, WI; Jeffrey S. Munroe, Middlebury College, Middlebury, VT

Increasingly focused field investigations and expanding application of newly developed methodologies continue to refine details of Quaternary landscape change in the Rocky Mountains. This session will provide a forum for presenting results of recent studies of the interactions of geomorphic processes and landscape evolution in this region. ORAL

## **T108 Sedimentary Records of Rapid Ice Sheet Decay and Intensive Ice-Calving Events**

.....  
Quaternary Geology/Geomorphology; Sediments, Clastic; Stratigraphy

Amir Mokhtari Fard, American University of Beirut, Beirut, Lebanon

This session will focus on the investigation in the sedimentary records of Pleistocene as well as present ice sheets, ice caps, and large Himalayan glaciers to reveal the deglaciation mechanisms under rapid ice sheet retreat and intensive ice-calving events. ORAL

## **T109 New Insights into the Origins of Glacial Landscapes**

Quaternary Geology/Geomorphology

Staci L. Goetz-Ensminger, Northwest Missouri State University, Maryville, MO; Nelson R. Ham, St. Norbert College, De Pere, WI; Jeffrey C. Strasser, Augustana College, Rock Island, IL

This session will focus on interrelated glaciological and geological processes of modern and ancient glaciers and ice sheets in an effort to develop a better understanding of the origins of glacial landscapes. ORAL and POSTER

## **T110 Assessing the Deglacial Record of Quaternary Ice Sheets**

*GSA Quaternary Geology and Geomorphology Division*

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Tracy A. Brennand, Simon Fraser University, Burnaby, BC; Jerome-Etienne Lesemann, Simon Fraser University, Burnaby, BC

This session explores different styles, spatial patterns, and chronologies of deglaciation as inferred from the geomorphic and sedimentary record of past ice sheets. ORAL

## **T111 McMurdo Dry Valleys, Antarctica, 1903–2003: A Celebration of a Century of Science**

*GSA Limnogeology Division*

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Geomicrobiology

W. Berry Lyons, Ohio State University, Columbus, OH; Andrew G. Fountain, Portland State University, Portland, OR

The first humans entered the McMurdo Dry Valleys, Antarctica region, in December 1903. Since this time, the dry valleys have yielded important geological and paleoclimatic data as well as provided a terrestrial analog to Mars. ORAL

## **T112 Tills We Meet Again: Terrestrial Records of Pre-Wisconsinan Glaciations, their Relationship to Other Pleistocene Climate Records, and Their Paleoclimatic Significance**

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Stratigraphy

Greg Balco, University of Washington, Seattle, WA; Carrie Jennings Patterson, University of Minnesota, St. Paul, MN

Glaciers are the defining feature of the Quaternary Earth, yet most pre-Wisconsinan glacial deposits are not accurately dated. We seek papers that apply old or new dating or correlation techniques to early and middle Pleistocene terrestrial sediments, with the aim of illuminating the role of ice sheets in the Quaternary climate system. ORAL

## **T113 Glaciers, Glacial Geology, and Glacial Ecosystems in the National Parks**

*National Park Service*

Environmental Geoscience; Quaternary Geology/Geomorphology; Geoscience Information/Communication

Harold S. Pranger, Denver, CO

Effective use of monitoring and research is needed to recognize and anticipate unique ecological aspects of park units containing glaciers. ORAL

## **T114 Isotopic Determination of Sediment Provenance: Techniques and Applications**

*GSA Sedimentary Geology Division*

Sediments, Clastic; Geochemistry, Other; Tectonics

Paul Karl Link, Idaho State University, Pocatello, ID; Mark Fanning, Australian National University, Canberra, Australia;

J. Brian Mahoney, University of Wisconsin, Eau Claire, WI

Isotopic and geochronologic techniques (detrital zircon U-Pb, Ar-Ar on K-feldspar and mica, Sm-Nd and Hf isotopes) to determine provenance and history of sedimentary basins. Session includes geologic applications to tectonic reconstruction. ORAL and POSTER

## **T115 New Applications of Provenance Analysis to Landscape Evolution and Sediment Transport Systems**

*GSA Sedimentary Geology Division*

Sediments, Clastic; Stratigraphy; Tectonics

Matthias Bernet, University of Canterbury, Christchurch, New Zealand; Kari Bassett, University of Canterbury, Christchurch, New Zealand

This session will present new applications of sedimentary provenance analysis to exhumation studies, sediment recycling, and sediment transport systems. Emphasis will be on innovative applications of provenance analysis to landscape evolution and on new uses for established techniques, such as SEM-cathodoluminescence analysis of quartz. ORAL and POSTER

## **T116 Sabkha Environments, Recent Insights**

*GSA Hydrogeology Division*

Hydrogeology; Sediments, Carbonates; Paleoclimatology/Paleoceanography

Warren W. Wood, Reston, VA; Abdulrahman S. Alsharhan, U.A.E. University, Al-Ain, United Arab Emirates; Peter T. Kolesar, Utah State University, Logan, UT

In 40 years since wide recognition of importance of sabkhas in the geologic record, new models of ecology, chemical evolution, solute, and water sources associated with sabkha development have been proposed. Their use in deciphering climate change has added to their interest. ORAL

## **T117 Influence of Tsunamis in the Geological Record**

*GSA Sedimentary Geology Division*

# Call for Papers

Sediments, Clastic; Marine/Coastal Science; Neotectonics/Paleoseismology

Frank R. Effensohn, University of Kentucky, Lexington, KY; Kevin G. Stewart, University of North Carolina, Chapel Hill, NC

Tsunamis are relatively common products of major geologic processes, yet their deposits have received remarkably little attention, especially in the pre-Quaternary record. Hence, the session is devoted to understanding diagnostic characteristics of tsunami deposits and using these to interpret the older sedimentary record. ORAL

## **T118 From the Abyss to the Beach: In Honor of Orrin H. Pilkey**

Sediments, Clastic; Marine/Coastal Science; Geoscience Education

David M. Bush, State University of West Georgia, Carrollton, GA; Bruce F. Molnia, U.S. Geological Survey, Reston, VA

Orrin Pilkey has touched the lives of many. This session celebrates the remarkable impact of a career that spanned deep-sea, continental shelf, and coastal studies. We hope to do more than simply rehash 40 years of research and education, but to also celebrate the accomplishments of a generation of researchers and educators he helped produce. ORAL

## **T119 Revisiting the Biogeochemistry of Black Shales and Oxygen-Deficient Marine Environments**

*Geochemical Society*

Geochemistry, Organic; Paleoclimatology/Paleoceanography; Sediments, Clastic

Richard B. Schultz, Elmhurst College, Elmhurst, IL; Timothy W. Lyons, University of Missouri, Columbia, MO

Origins of organic-rich facies will be explored in light of new research on bacterial redox pathways, trace metal biogeochemistry, nutrient cycling, organic geochemistry, isotope techniques, chemostratigraphy, ecological and petrographic relationships, depositional models, and improved modern analogs. ORAL and POSTER

## **T120 Sedimentology and Oceanography of Phosphogenic Systems**

Sediments, Carbonates; Sediments, Clastic; Paleoclimatology/Paleoceanography

Peir K. Pufahl, Queen's University, Kingston, ON; Eric E. Hiatt, University of Wisconsin, Oshkosh, WI

This session will bring together a diverse group of researchers to explore controversies surrounding phosphorus accumulation and preservation of sedimentary apatite. A process-oriented approach will elucidate oceanographic and depositional controls over geologic time. ORAL and POSTER

## **T121 Fortieth Anniversary of Sloss's Cratonic Sequences: Sequence Stratigraphy of the Sauk Sequence**

Stratigraphy; Sediments, Carbonates; Paleontology/Paleobotany

Kevin R. Evans, Southwest Missouri State University, Springfield, MO; James F. Miller, Southwest Missouri State University, Springfield, MO

Sloss's classic publication on North American stratigraphy introduced the concept of Sequences. We encourage papers on all aspects of sequence stratigraphy within the Sauk Sequence. This session follows a field trip to spectacular localities in western Utah. ORAL and POSTER

## **T122 Clinofolds: Past, Present, and Modeled**

*GSA Sedimentary Geology Division*

Stratigraphy; Sediments, Clastic; Marine/Coastal Science

Charles A. Nittrouer, University of Washington, Seattle, WA; Lincoln F. Pratson, Duke University, Durham, NC; David Mohrig, Massachusetts Institute of Technology, Cambridge, MA

Clinofolds are a fundamental unit of stratigraphy that is observed in a range of sedimentary environments over scales of centimeters to tens of kilometers. This session will examine observational (modern and ancient), experimental, and modeling studies of their formation. ORAL and POSTER

## **T123 Advances in Stratigraphic Analyses Using Ground Penetrating Radar**

*GSA Geophysics Division; GSA Engineering Geology Division*

Geophysics/Tectonophysics/Seismology; Quaternary Geology/Geomorphology; Hydrogeology

Gregory S. Baker, University at Buffalo (SUNY), Buffalo, NY; Harry M. Jol, University of Wisconsin, Eau Claire, WI

The session will cover a broad range of ground penetrating radar (GPR) studies related to stratigraphic analyses. Topics include reservoir and environmental site characterization, hydrogeophysics, geological hazard investigation, and stratigraphic-facies analyses of geomorphic environments (including eolian, fluvial, glacial, and coastal). ORAL and POSTER

## **T124 The Geologic Record of Biosphere Dynamics—The Key to Understanding the Biotic Effects of Future Environmental Change**

*GSA Geobiology and Geomicrobiology Division*

Geomicrobiology

Karl W. Flessa, University of Arizona, Tucson, AZ; David A. Feary, National Research Council, Washington, D.C.

This session will focus on a recent National Research Council report that proposes strategies for integrating earth and biological sciences as a means of understanding biotic response to environmental change, and recommends programmatic, infrastructural, and management changes to best advance this emerging interdisciplinary science area. ORAL

## **T125 Geology and Paleocology of the Beringian Subcontinent: To Honor the Career of David M. Hopkins**

*Alaska Quaternary Center (AQC)*

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Archaeological Geology

Sarah J. Fowell, University of Alaska, Fairbanks, AK; Patricia Heiser, University of Alaska, Anchorage, AK

The concept of Beringia as a subcontinent with a unique flora and fauna can be largely attributed to David M. Hopkins. This session will highlight current research by Dave's students, coworkers, and colleagues. Presentations should focus on advances in Beringian paleoecology and future research directions. ORAL and POSTER

## T126 Testing Rodinia Using New Maps Compiled for Each Craton through IGCP 440

*GSA Structural Geology and Tectonics Division, International Geologic Correlation Project; Tectonics Special Research Center*

Tectonics; Precambrian Geology

Karl E. Karlstrom, University of New Mexico, Albuquerque, NM; Svetlana V. Bogdanova, University of Lund, Lund, Sweden

The pre-Pangean supercontinent of Rodinia has been the subject of debate since it was proposed over a decade ago. This session will present results from an international correlation project (IGCP 440) designed to compile new data from each craton to test some of the numerous models for the shape, evolution, and even the existence of Rodinia. ORAL

## K-16 PROGRAM

Attention College Faculty, K-12 Teachers, Teacher Trainers, and Pre-Service Teachers: Look for the K-16 Education Workshops listing in the June issue of *GSA Today*.

Questions? Contact Julie Sexton at [jsexton@geosociety.org](mailto:jsexton@geosociety.org) or (303) 357-1005 for more information.



Channeled Scablands. Dry Falls State Park, Washington. Photo by John Karachewski.

## T127 New Perspectives on Neoproterozoic–Early Paleozoic Development of Western Laurentia: In Honor of John Cooper

Stratigraphy; Sediments, Carbonates; Sediments, Clastic

Mike Pope, Washington State University, Pullman, WA; Chris Fedo, George Washington University, Washington, D.C.

This session will examine new perspectives (e.g., detrital zircon geochronology, LA-MC-ICP-MS, detailed sequence stratigraphy, isotope chemostratigraphy, geobiology, etc.) that are being used to determine the Neoproterozoic–Early Paleozoic development of western Laurentia. ORAL and POSTER

## T128 Barremian to Turonian Carbonate Platform Facies in Northeastern Mexico, their Paleogeographic, Paleoceanic, and Paleoclimatic Implications: Comparison with Coeval Facies Elsewhere in the Tethys (Posters)

Stratigraphy; Paleoclimatology/Paleoceanography; Sediments, Carbonates

Florentin J. Maurrasse, Florida International University, Miami, FL

Comparison of Lower to Upper Cretaceous facies of northeastern Mexico with coeval deposits around the Tethys for a better understanding of spatial and temporal changes in relation to the paleogeography, paleoceanography, and paleoclimate of that time interval. POSTER

## T129 The Jurassic System of North America: Stratigraphy, Tectonics, and Depositional History (Posters)

*GSA Structural Geology and Tectonics Division*

Stratigraphy; Tectonics; Sediments, Clastic

William C. Parcell, Wichita State University, Wichita, KS

This session will focus on the depositional and tectonic evolution of North America during the Jurassic Period. We

encourage contributions that discuss the causal relationships between sedimentologic processes, tectonic events, and the resulting stratigraphic record during this period. POSTER

## T130 Advances in Understanding Fault Mechanics: Beyond Mohr-Coulomb

*GSA Structural Geology and Tectonics Division*

Structural Geology; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology

Juliet G. Crider, Western Washington University, Bellingham, WA

In the years since Anderson's "Dynamics of Faulting," many other approaches to faulting have been proposed, but few are as widely applied. This session will review and advance alternative or supplemental theories for understanding how faults work, plus highlight successful field applications of new or alternative approaches. ORAL

## T131 Seismogenic Friction and Pseudotachylites

*GSA Structural Geology and Tectonics Division, GSA Geophysics Division*

Structural Geology; Geophysics/Tectonophysics/Seismology; Tectonics

Eric C. Ferre, Southern Illinois University, Carbondale, IL; Joseph L. Allen, Concord College, Athens, WV; Kieran O'Hara, University of Kentucky, Lexington, KY

Fault-related pseudotachylites are the fascinating product of coseismic deformation occurring during large magnitude earthquakes. This session will present a blend of new results from structural geology, seismology, rock magnetism, geochemistry, mineralogy, and geochronology. ORAL and POSTER

## T132 Understanding Coupled Metamorphic and Deformational Processes: Advances in Integrated Textural, Chemical, and Microstructural Analysis

*GSA Structural Geology and Tectonics Division; Mineralogical Society of America*

# Call for Papers

Structural Geology; Petrology,  
Metamorphic; Tectonics

Gary S. Solar, SUNY College, Buffalo, NY;  
Aaron Stallard, University of Canterbury,  
Christchurch, New Zealand

Innovative combination of petrologic,  
geochemical, and structural analysis re-  
veals the dynamics between syn-  
chronous metamorphism and deforma-  
tion. Speakers will address these  
relations using established and new  
techniques of investigating textures and  
chemistry in deformed metamorphic  
rocks to illustrate our understanding of  
these processes. ORAL and POSTER

## **T133 Exhumation Along Major Continental Strike-Slip Fault Systems**

*GSA Structural Geology and Tectonics  
Division*

Tectonics; Structural Geology; Petrology,  
Metamorphic

Sarah Roeske, University of California,  
Davis, CA; Alison Till, U.S. Geological  
Survey, Anchorage, AK; Dwight Bradley,  
U.S. Geological Survey, Anchorage, AK

Exhumation of metamorphic rocks  
along transcurrent faults occurs in both  
extension and contraction environ-  
ments. This session seeks contributions  
from researchers examining this process  
in active or ancient orogens and/or by  
analogue or numerical modeling. ORAL  
and POSTER

## **T134 The Columbia River Flood Basalts: New Insights into the Volcanism, Petrology, and Tectonism of a Large Igneous Province**

*GSA Structural Geology and Tectonics  
Division*

Volcanology; Petrology, Igneous;  
Tectonics

Heather L. Petcovic, Oregon State  
University, Corvallis, OR; Bart S. Martin,  
Ohio Wesleyan University, Delaware,  
OH; Stephen P. Reidel, Pacific Northwest  
National Lab and Battelle Memorial  
Institute, Richland, WA

We seek papers covering a broad range  
of topics, including: the origin of the  
Columbia River Flood Basalts, lava em-  
placement rates and mechanisms,

magma petrogenesis and geochemical  
modification, and tectonic history of the  
Columbia Plateau. ORAL and POSTER

## **T135 Hydrothermal Alteration on Active Volcanoes: Processes, Rates, and Applications to Hazards and Resources**

*Society of Economic Geologists*

Economic Geology; Volcanology;  
Geochemistry, Other

David A. John, U.S. Geological Survey,  
Menlo Park, CA; Thomas W. Sisson, U.S.  
Geological Survey, Menlo Park, CA

Study of hydrothermal alteration tradi-  
tionally has been undertaken by eco-  
nomic geologists interested in mineral  
and geothermal resources. This session  
aims at bringing together researchers  
from many disciplines to present new re-  
search results on the processes that form  
hydrothermal alteration on active volca-  
noes and applications of these results.  
ORAL

## **T136 Shallow Submarine Hydrothermal Vents: Geology, Geochemistry, and Biota**

*Marine/Coastal Science*

Rosa Ma. Prol-Ledesma, Universidad  
Nacional Autónoma de México, México  
DF, México; Carles Canet, Universidad  
Nacional Autónoma de México, México  
D.F., México; Matthew J. Forrest, Moss  
Landing Marine Labs, Moss Landing, CA

This session will address the unique  
qualities of the mineralogy and biota ob-  
served around shallow-water hydrother-  
mal vents. The geochemistry of the vent  
fluids is the result of mixing of thermal  
reservoir water and seawater, and is in-  
fluenced by the microbial activity pre-  
sent at the vents. ORAL and POSTER

## **T137 Submarine Hydrothermal Systems: The Emergence of Geobiology**

*Geomicrobiology; Volcanology;  
Geochemistry, Other*

Deborah S. Kelley, University of  
Washington, Seattle, WA; John Baross,  
University of Washington, Seattle, WA

The connection between volcanism and  
life perhaps is nowhere more evident

than at mid-ocean ridges. This session  
will focus on new discoveries surround-  
ing linkages among crustal formation,  
hydrothermal vents, and life at mid-  
ocean ridge spreading centers. ORAL and  
POSTER

## **T138 From Oxides to Anorthosites: A Tribute to D.H. Lindsley**

*Mineralogical Society of America;  
Geochemical Society*

Petrology, Experimental; Petrology,  
Igneous; Mineralogy/Crystallography

Hanna Nekvasil, State University of New  
York, Stony Brook, NY; B. Ronald Frost,  
University of Wyoming, Laramie, WY

This session will focus on new contribu-  
tions to phase stability and thermody-  
namics of igneous minerals and melts,  
and the origin and evolution of rocks in  
intraplate regimes, especially anorthosites  
and associated rocks. ORAL and POSTER

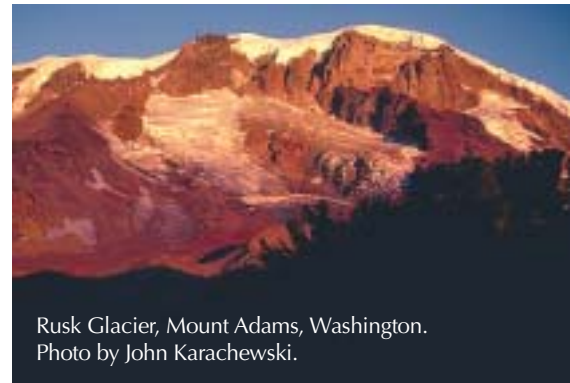
## **T139 Granites at Convergent Margins: Physical and Chemical Constraints on Processes and Petrogenesis**

*Mineralogical Society of America*

Petrology, Igneous; Structural Geology;  
Geochemistry, Other

Paul B. Tomascak, University of  
Maryland, College Park, MD; Scott  
Paterson, University of Southern  
California, Los Angeles, CA

We seek papers on investigations of  
granites and granophile mineral deposits  
at modern and ancient convergent mar-  
gins. Of primary interest: studies under-  
scoring the importance of integrated  
field-structural-geophysical-geochrono-  
logical-geochemical techniques, and



Rusk Glacier, Mount Adams, Washington.  
Photo by John Karachewski.

novel laboratory studies. ORAL and POSTER

**T140 Modeling Metamorphism: Petrology, Geochemistry, and Tectonics**

.....  
*Mineralogical Society of America, Geochemical Society; GSA Structural Geology and Tectonics Division*

Petrology, Metamorphic; Geochemistry, Other; Tectonics

Michael Brown, University of Maryland, College Park, MD; Barbara L. Dutrow, Louisiana State University, Baton Rouge, LA

This session encourages contributions from a wide variety of subdisciplines that use modeling to understand the petrology, geochemistry, and tectonics of lithosphere evolution: from nucleation and growth of crystals to orogenesis, from fluid flow to melting, and from quantifying extensive variables to understanding the rheology of metamorphic belts. ORAL and POSTER

**T141 Phase Relations, High *P-T* Terrains, *P-T*-ometry and Plate Pushing: A Tribute to W.G. Ernst**

.....  
*Mineralogical Society of America*

Petrology, Metamorphic; Petrology, Igneous; Tectonics

Sorena S. Sorensen, Washington, D.C.; Mark Cloos, University of Texas, Austin, TX; M. Charles Gilbert, University of Oklahoma, Norman, OK

A Gary Ernst tribute: mineral and rock phase relations, field relations of high *P-T*, UHP, and arc terrains, subduction zone tectonics and evolution, plate tectonic synthesis of orogenic belts, and earth science writ large. ORAL and POSTER

**T142 Structure and Stratigraphy: New Perspectives on Lithotectonic Processes**

.....  
*GSA Structural Geology and Tectonics Division*

Structural Geology; Stratigraphy

Mark P. Fischer, Northern Illinois University, De Kalb, IL; David Anastasio, Lehigh University, Bethlehem, PA

Variability in structures and structural processes are controlled by sedimentological and stratigraphic variables operating at multiple scales. Examples include fold and fault geometries, strain partitioning, and mesoscopic deformation patterns. This session showcases research that integrates structural and stratigraphic analyses. ORAL and POSTER

**T143 Earthquake Geology in Reverse-Faulting Terrains**

.....  
*GSA Quaternary Geology and Geomorphology Division*

Neotectonics/Paleoseismology; Quaternary Geology/Geomorphology; Structural Geology

Alan R. Nelson, U.S. Geological Survey, Denver, CO; Brian L. Sherrod, U.S. Geological Survey, Seattle, WA

Earthquake geology—study of the kinematics, history, and effects of earthquakes and related earth movements—requires diverse and innovative approaches in regions of active reverse faulting and folding. We encourage contributions about approaches and techniques applicable to the recently glaciated, heavily forested U.S. Pacific Northwest. ORAL and POSTER

**T144 Tectonics of the Circum-Pacific Rim in Space and Time: Focus on Alaska, Central and South America, and the Western Pacific**

.....  
*GSA International Division; U.S. National Committee on the Geological Sciences; Circum-Pacific Council; GSA Structural Geology and Tectonics Division*

Tectonics; Petrology, Igneous; Geophysics/Tectonophysics/Seismology

Suzanne Mahlburg Kay, Cornell University, Ithaca, NY; Mark Cloos, University of Texas, Austin, TX

Comparative and specific studies of the Circum-Pacific rim lead to new insights on the relative importance of tectonic factors controlling subduction processes. Interdisciplinary papers that consider broad aspects of all or parts of the rim are encouraged. ORAL and POSTER

**T145 The Washington Cascades: An Integrated Perspective on 100 Million Years of Orogenesis, Magmatism, and Surface Processes**

.....  
*GSA Geophysics Division; GSA Structural Geology and Tectonics Division*

Tectonics; Quaternary Geology/Geomorphology; Petrology, Igneous

Peter W. Reiners, Yale University, New Haven, CT; Donna L. Whitney, University of Minnesota, Minneapolis, MN

The Cascades orogen in Washington is a regional tectonic, topographic, and climatic transition zone. The session will examine the structural, petrologic, geophysical, and geomorphic evolution of the Cascades, including relationships between petrologic/tectonic events and surficial processes and mechanisms, timing, and rates of uplift and erosion. ORAL and POSTER

**T146 Collisional Tectonics of the Northwest Cordillera: Integration of New Data in Basin Development, Magma Petrogenesis, Geophysics, Structural, and Metamorphic Analysis (Posters)**

.....  
*GSA Structural Geology and Tectonics Division*

Tectonics; Stratigraphy; Petrology, Igneous

Ronald B. Cole, Allegheny College, Meadville, PA; Kenneth D. Ridgway, Purdue University, West Lafayette, IN

A forum for new data on terrane accretion processes in southern Alaska and western Canada. Emphasis on structures, basins, and arc systems along terrane suture zones and across terrane assemblages and on plate kinematics related to terrane collision. POSTER

**T147 Crustal Character of the Northwestern Cordilleran Continental Margin**

.....  
*GSA Geophysics Division; GSA Structural Geology and Tectonics Division*

Geophysics/Tectonophysics/Seismology; Tectonics

R.W. Saltus, U.S. Geological Survey, Denver, CO; T.L. Hudson, Applied



Needles–Gray Wolf Lithic Assemblage from Deer Park, Olympic National Park, Washington. Photo by John Karachewski.

## Call for Papers

Geology, Sequim, WA; D.B. Snyder, Geological Survey of Canada, Ottawa, ON

Presentation of seismic, gravity, and magnetic interpretations (particularly multidisciplinary transects), as well as complimentary studies, that elucidate the full crustal character along the complex continental margin of the northwestern Cordillera. ORAL and POSTER

### T148 The Cascade Volcanic Arc System

Volcanology; Geophysics/Tectonophysics/Seismology; Tectonics

Patrick Muffler, U.S. Geological Survey, Menlo Park, CA; Richard J. Blakely, U.S. Geological Survey, Menlo Park, CA

This session seeks to integrate geological, geochemical, geophysical, and tectonic studies of the Cascade Range into a better understanding of what constitutes the Cascade volcanic arc as a system. Our theme is “connectivity.” Speakers are encouraged to look beyond their pieces of real estate and truly integrate beyond their specialties. ORAL and POSTER

### T149 Seismic Hazards and Neotectonics in Southern Nevada (Posters)

GSA Geophysics Division

Tectonics; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology

Catherine M. Snelson, University of Nevada, Las Vegas, NV; Wanda J. Taylor, University of Nevada, Las Vegas, NV

Recent studies have provided new insights into the neotectonics in southern Nevada. As a result, interest has increased in the seismic hazard assessment, which is particularly important in light of the population growth in Southern Nevada. This session will bring together new and existing studies to address the seismic hazard issues that face the region. POSTER

### T150 New Views of Seismic Hazard in Cascadia I: Seismology and Seismotectonics

GSA Geophysics Division

Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology; Structural Geology

Thomas M. Brocher, U.S. Geological Survey, Menlo Park, CA; Kate C. Miller, University of Texas, El Paso, TX; Thomas L. Pratt, U.S. Geological Survey, Seattle, WA

This session showcases latest advances in our understanding of the structural framework, seismotectonics, and site response in Cascadia. Papers will include new results from site response studies in the Seattle basin, crustal imaging of the forearc, monitoring silent-slip events along the megathrust, and studies of the 2001 Nisqually earthquake. ORAL and POSTER

### T151 New Views of Seismic Hazard in Cascadia II: Neotectonics of the Cascadia Forearc

GSA Structural Geology and Tectonics Division

Neotectonics/Paleoseismology; Tectonics; Quaternary Geology/Geomorphology

Samuel Y. Johnson, U.S. Geological Survey, Lakewood, CO; Ray E. Wells, U.S. Geological Survey, Menlo Park, CA

Multidisciplinary studies of convergent margin deformation and its relation to contemporary strain in the Cascadia forearc, northern California to southern British Columbia. ORAL

### T152 Global Climate Changes: Abrupt Late Pleistocene Climatic Reversals and Modern Global Warming

GSA Quaternary Geology and Geomorphology Division

Don J. Easterbrook, Western Washington University, Bellingham, WA; Edward B. Evenson, Lehigh University, Bethlehem, PA; John Gosse, Dalhousie University, Halifax, NS

This session will explore global, Late Pleistocene, rapid climatic changes, focusing on the Younger Dryas and Intra-Allerod Cold Period and aspects of global warming during the past century and earlier natural climatic changes. ORAL

## Students: Apply for Travel Grants Today

The GSA Foundation has awarded \$4,500 in grants to each of the six GSA sections. The money, when combined with equal funds from the sections, is used to help GSA undergraduate Student Associates and graduate Student Members travel to GSA meetings.

For information and deadlines, contact your GSA Section secretary:

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## HOW TO SUBMIT YOUR ABSTRACT

Please use the online abstract form found on the GSA Web site, [www.geosociety.org](http://www.geosociety.org). An abstract submission fee of \$18 for all students and \$30 for all others will be charged. If you cannot submit your abstract electronically, contact Nancy Carlson, (303) 357-1061, [ncarlson@geosociety.org](mailto:ncarlson@geosociety.org).

From the home page of [www.geosociety.org](http://www.geosociety.org), click on "Submit an Abstract" and follow the steps given. If you lose your Internet connection before you are finished, you can resume making a submission when you log back on.

You and your coauthors will be provided (by e-mail) with a record of the abstract identification number and password, and you can access your abstract and revise it as necessary from any Internet connection up until the published abstract submission deadline date (July 15).

The system supports the submission of complex abstracts that contain subscripts, superscripts, italic and boldface type, tables, Greek letters, and equations.

## SCIENTIFIC CATEGORIES

Determine if your paper would fit neatly under one of the topical sessions. If it doesn't, please submit your abstract for inclusion in the general discipline sessions. The available choices are:

Archaeological Geology  
 Coal Geology  
 Economic Geology  
 Engineering Geology  
 Environmental Geoscience  
 Geochemistry, Aqueous  
 Geochemistry, Organic  
 Geochemistry, Other  
 Geomicrobiology  
 Geophysics/Tectonophysics/  
 Seismology  
 Geoscience Education  
 Geoscience  
 Information/Communication  
 History of Geology  
 Hydrogeology  
 Limnogeology  
 Marine/Coastal Science  
 Mineralogy/Crystallography  
 Neotectonics/Paleoseismology  
 Paleoclimatology/  
 Paleoceanography  
 Paleontology/Paleobotany  
 Petrology, Experimental  
 Petrology, Igneous  
 Petrology, Metamorphic  
 Planetary Geology  
 Precambrian Geology  
 Public Policy  
 Quaternary Geology/  
 Geomorphology  
 Remote Sensing/Geographic  
 Info System  
 Sediments, Carbonates  
 Sediments, Clastic

Stratigraphy  
 Structural Geology  
 Tectonics  
 Volcanology

## PRESENTATION MODES

Select your preferred mode of presentation: Oral, Poster, or Either (no preference). *Please Note:* The program organizers will do their best to fit you into your preferred mode. However, they will override your original mode selection if they feel your paper would fit well in a particular session with other compatible abstracts. The decision of the program organizers is final.

*Oral Mode.* This is a verbal presentation before a seated audience. The normal length of an oral presentation is 12 minutes, plus three minutes for discussion.

*Poster Mode.* Each poster session presenter is provided with one horizontal, free-standing display board approximately 8' wide and 4' high. Precise measurements will appear in the Speaker Guide, which will be posted on the GSA Web site in September. The speaker must be in the poster booth for at least two of the four presentation hours.

Papers for discipline sessions may be submitted in either oral or poster mode. Papers for topical sessions are to be submitted *only* in the mode noted in the session description. If a topical abstract is submitted in the incorrect mode, the abstract will be transferred automatically to a discipline session.

## ABSTRACT BODY

Please keep it to 2,000 characters or fewer. The online abstract system will reject it if it exceeds this limit.

If you want to include a table with your abstract, you may. But understand that the table might reduce the number of words allowed in your abstract. Taken together, the body of the abstract should take up no more space than would be occupied by roughly 2,000 characters alone.

Check the spelling of the abstract's body and title using your own word processor. Then read it again and make sure that it is something the whole world should see. (We won't check or edit it for you.)

For typing and pasting, add an extra line between paragraphs or they will run together when displayed (you can do this before copying or after pasting, or while typing).

## ABSTRACT FEE

Once the abstract is in place, a window to submit payment will appear. The non-refundable submission fee is \$18 for all students; \$30 for all others.

You May Present Only One Volunteered Abstract

- Please submit only one *volunteered* abstract as speaker or poster presenter in topical and/or discipline sessions. This helps avoid speaker-scheduling conflicts and gives everyone an equal opportunity to be heard. Multiple submissions as speaker-presenter will result in rejection of all abstracts.
- This limitation does not apply to, nor does it include, *invited* contributions to keynote symposia or topical sessions.

## JTPC TO FINALIZE PROGRAM IN MID-AUGUST

The Joint Technical Program Committee (JTPC) selects abstracts and determines the final session schedule. All authors will be notified in August. The JTPC includes representatives from those GSA Associated Societies and Divisions participating in the technical program. GSA Council approved the JTPC technical program chairs.

# Seattle 2003 Field Trips

The 2003 GSA Annual Meeting in Seattle will provide geoscientists a diverse suite of field trips that take full advantage of the region's unique geologic setting. The geologic history of this region is particularly complex and interesting because of the accretion of exotic terranes to the western margin of North America over the past 200 million years, the most recent being the Olympic Mountain terrane. Furthermore, the advance and retreat of continental and alpine glacial systems throughout the Quaternary has left an extensive erosional and depositional record above the older rock record.

Our field trip schedule offers participants an opportunity to study geologic processes through the Cambrian to modern time. Included in our program are one-day trips to observe and discuss local geologic features and processes (i.e., mass wasting, volcanic and seismic processes) that have both regional and societal implications. We also have a broad choice of multi-day field trips that will offer participants an opportunity to visit some of most scenic and geologically interesting locations in the Pacific Northwest and beyond.

Most trips start and end in Seattle. Air travel plans that include a Saturday night stay can substantially offset field trip costs. The following list is tentative and subject to change. Further details will be given when registration for the meeting begins in June. For more information, contact the field trip leader or the 2003 field trip chair: Terry Swanson, Dept. of Earth and Space Sciences, University of Washington, Seattle, WA, (206) 543-1923, fax 206-543-0489, tswanson@u.washington.edu.

## PREMEETING

### Island and Coastal Hydrogeology of Hawaii

Sun.–Fri., Oct. 26–31. Stephen B. Gingerich, U. S. Geological Survey, 677 Ala Moana Blvd., #415, Honolulu, HI, 96813, (808) 587-2411, fax 808-587-2401, sbginger@usgs.gov; Stephen Wheatcraft. Max.: 20. Cost: \$690. *Begins on the Big Island of Hawaii and ends on Oahu.*

### Glacial Lake Missoula, Clark Fork Ice Dam and the Floods Outburst Area: Northern Idaho and Western Montana.

Wed.–Fri., Oct. 29–31. Norman Smyers, USDA Forest Service, Lolo National Forest, Bldg. 24, Fort Missoula, Missoula, MT 59804, (406) 329-3775, fax 406-329-3795, nsmyers@fs.fed.us; Roy Breckenridge. Max.: 42. Cost: \$290. *Begins and ends in Spokane, Washington.*

### Sequence Stratigraphy of the Sauk Sequence: 40th Anniversary Field Trip in Western Utah

Wed.–Sat., Oct. 29–Nov. 1. Kevin Evans, Dept. of Geography, Geology, and Planning, Southwest Missouri State University, Springfield, MO 65804, (417) 836-5590, fax 417-836-6006, kre787f@smsu.edu; Jim Miller; Ben Dattilo. Max.: 30. Cost: \$295. *Begins and ends in Salt Lake City, Utah.*

### Tectonic Geomorphology and the Record of Quaternary Plate Boundary Deformation in the Olympic Mountains

Wed.–Sat., Oct. 29–Nov. 1. Frank J. Pazzaglia, Dept. of Earth and Environmental Sciences, Lehigh University, 31 Williams, Bethlehem, PA 18015, (610) 758-3667, fax 610-758-3677, fjp3@lehigh.edu; Glenn Thackray; Mark T. Brandon; Eric McDonald; John Gosse; Karl Wegmann. Max.: 24. Cost: \$525.

### Wine and Geology—The Terroir of Washington State

Thurs.–Fri., Oct. 30–31. Cosponsored by *Society of Economic Geologists*. Lawrence D. Meinert, Dept. of Geology, Washington State University, Pullman, WA, 99164-2812, (509) 335-2261, fax 509-335-7816, meinert@wsu.edu; Alan J. Busacca. Max.: 44. Cost: \$315.

### Coastal Evolution, Dynamic Shoreline Processes, and Beach Management Controversies of the Columbia River Littoral Cell, Southwest Washington and Northern Oregon

Thurs.–Sat., Oct. 30–Nov. 1. Sandy Vanderburgh, Dept. of Geography, University College of the Fraser Valley, 33844 King Road, Abbotsford, British Columbia, Canada, V2S 7M8, (604)

504-7441, ext. 4336, fax 604-855-7558, vanderburghs@ucfv.bc.ca; Guy Gelfenbaum; Curt Peterson; Harry Jol; Jim Phipps. Max.: 40. Cost: \$415.

### Columbia River Basalt and Yakima Fold Belt Field Trip

Thurs.–Sat., Oct. 30–Nov. 1. Stephen Reidel, Pacific Northwest National Laboratory, K6-81, P.O. Box 999, Richland, WA 99352, (509) 376-9932, fax 509-376-5368, sp.reidel@pnl.gov; Bart Martin; Heather Petcovic. Max.: 22. Cost: \$290.

### Cretaceous to Paleogene Cascades Arc: Structure, Metamorphism, and Time Scales of Magmatism, Burial, and Exhumation of a Crustal Section

Thurs.–Sat., Oct. 30–Nov. 1. Cosponsored by *GSA Structural Geology and Tectonics Division*. Robert Miller, Dept. of Geology, San Jose State University, San Jose, CA 95192-0102, (408) 924-5025, fax 408-924-5053, rmiller@geosun.sjsu.edu; Jennifer Matzel; Scott Paterson; Harold Stowell. Max.: 35. Cost: \$305.

### Pleistocene Glaciation of the Puget Lowland, North Cascades, and Columbia Plateau

Thurs.–Sat., Oct. 30–Nov. 1. Don J. Easterbrook, Dept. of Geology, Western Washington University, Bellingham, WA 98225, (360) 650-3583, fax 360-650-7302, dbunny@cc.wvu.edu. Max.: 24. Cost: \$340.

### Engineering Geology in the Central Columbia Valley

Fri.–Sat., Oct. 31–Nov. 1. Cosponsored by *GSA Engineering Geology Division* and *Association of Engineering Geologists*. Tom Badger, Washington State Department of Transportation, P.O. Box 47365, Olympia, WA 98504-7365, (360) 709-5461, fax 360-709-5585, badgert@wsdot.wa.gov; Dick Galster. Max.: 24. Cost: \$200.

### Regional Tertiary Sequence Stratigraphy and Regional Structure on the Eastern Flank of the Central Cascade Range, Washington

Fri.–Sat., Oct. 31–Nov. 1. Cosponsored by *Northwest Geological Society*. Eric S.

Cheney, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 543-1190, fax 206-543-3836, vaalbara@u.washington.edu. Max.: 21. Cost: \$245.

Holocene Lahars Along the White River Between Mount Rainier and Seattle  
 Sat., Nov. 1. Paul Zehfuss, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 543-6229, fax 206-685-2379, pzehfuss@u.washington.edu; Brian Atwater; James Vallance. Max.: 20. Cost: \$140.

Late Pleistocene Glacial History of Whidbey Island, Washington  
 Sat., Nov. 1. Terry W. Swanson, Quaternary Research Center, Dept. of Earth and Space Sciences, University of Washington, Box 351310 Seattle, WA 98195-1310, (206) 543-1923, fax 206-543-0489, tswanson@u.washington.edu. Max.: 44. Cost: \$95.

Pleistocene Tephrostratigraphy and Paleogeography of Southern Puget Sound Near Olympia, Washington  
 Sat., Nov. 1. Timothy J. Walsh, Washington DNR, Division of Geology and Earth Resources, P.O. Box 47007, Olympia, WA 98504-7007, (360) 902-1432, fax 360-902-1785, tim.walsh@wadnr.gov; Robert L. Logan; Michael Polenz; Marvin A. Lanphere; Thomas W. Sisson. Max.: 20. Cost: \$210.

Recent Geomorphological Discoveries in Central Washington  
 Sat., Nov. 1. Cosponsored by GSA Archaeological Geology Division. Gary Huckleberry, Dept. of Anthropology, Washington State University, Pullman, WA 99164-4910, (509) 335-4807, fax 509-335-3999, ghuck@wsu.edu; Jerry Galm; Stan Gough; Brett Lenz. Max.: 34. Cost: \$80.

## POSTMEETING

Evolution of a Polygenetic Ophiolite: The Jurassic Ingalls Ophiolite, Washington Cascades  
 Wed.-Fri., Nov. 5-7. Gregory Harper, Dept. of Earth and Atmospheric Sciences, SUNY, Albany, NY 12222, (518) 442-4476, fax 518-442-5825, gdh@albany.edu; Robert Miller; Jonathan Miller. Max.: 30. Cost: \$250.

Geohydrology of the Hanford Nuclear Waste Site in the South-Central Columbia Plateau  
 Wed.-Fri., Nov. 5-7. Roy E. Gephart, Pacific Northwest National Laboratory, P.O. Box 999, Mail Stop K8-88, Richland, WA 99352, (509)376-1421, fax 509-376-0846, roy.gephart@pnl.gov; Steve Reidel; Frank Spane; Karl Fecht. Max.: 20. Cost: \$240. *Due to security restrictions, only U.S. citizens can enter the Hanford Site on this tour.*

Puget Sound Paleoseismology  
 Thurs.-Fri., Nov. 6-7. Brian Sherrod, U.S. Geological Survey, Dept. of Earth and Space Sciences, Box 351310, University of Washington, Seattle, WA 98195, (206) 553-0153, fax 206-553-8350, bsherrod@ess.washington.edu; Alan

Nelson; Harvey Kelsey; Carrie Garrision-Laney. Max.: 45. Cost: \$170.

Hydrogeology of Cascade Range Volcanoes: Mount St. Helens, Mount Hood, and Central Oregon  
 Thurs.-Sat., Nov. 6-8. Cosponsored by GSA Hydrogeology Division. Steve Ingebritsen, U.S. Geological Survey, MS 439, 345 Middlefield Road, Menlo Park, CA 94025, (650) 329-4422, fax 650-329-4463, seingeb@usgs.gov; Terry Keith; Michael Manga; Larry Mastin. Max.: 40. Cost: \$370.

Quaternary Geology of Seattle  
 Thurs., Nov. 6. Cosponsored by GSA Quaternary Geology and Geomorphology Division. Kathy Goetz Troost, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 616-9769, fax 206-543-8954, ktroost@u.washington.edu; Derek Booth; Bill Laprade. Max.: 45. Cost: \$105.

## SEG FIELD TRIP

Hydrothermal Alteration in Ancient and Modern Volcanoes, Mount Rainier Area: Applications to Ore Genesis and Volcanic Hazards  
 Thurs., Nov. 6. Sponsored by Society of Economic Geologists. David John; Roger Ashley; Grant Newport; James Vallance; James Rytuba, Society of Economic Geologists, 7811 Shaffer Parkway, Littleton, CO 80127, (720) 981-7882, fax 720-981-7874, seg@segweb.org. Max.: 35. Cost: TBD.

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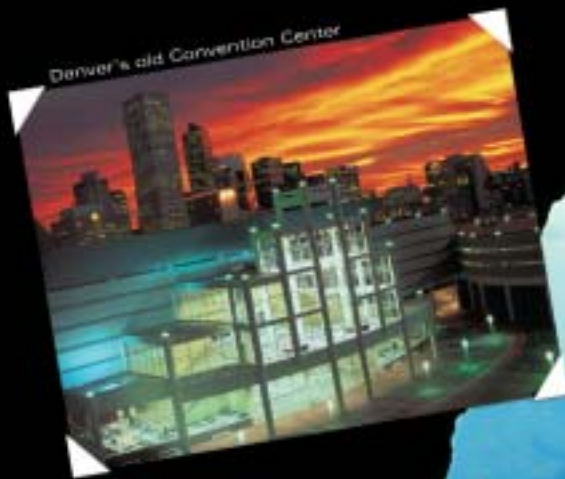
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November 7-10, 2004, Denver Colorado



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Mineral Ice Lake, Front Range, CO. Photo by John Karachewski.

## GSA-Sponsored Short Courses

Preregistration Deadline: September 26

Registration information and course descriptions will be published in the June issue of *GSA Today*. For additional information, contact Edna Collis, GSA headquarters, [ecollis@geosociety.org](mailto:ecollis@geosociety.org), or visit [www.geosociety.org](http://www.geosociety.org). (CEUs = continuing education units.)

### Applications of Environmental Isotopes for Tracing Anthropogenic Contaminants in Groundwaters and Surface Waters

Sat., Nov. 1. Cosponsored by *GSA Hydrogeology Division*. Carol Kendall and Tom Bullen, Water Resources Division, U.S. Geological Survey, Menlo Park. Fee: \$550. CEUs: 0.8.

### DEMs: The Topographic Dimension for Visualizing Geology, Geomorphology, and Active Tectonics

Sat., Nov. 1. Cosponsored by *GSA Geoscience Education Division* and *GSA Structural Geology and Tectonics Division*. Peter L. Guth, U.S. Naval Academy, Annapolis, MD; Ralph Haugerud, U.S. Geological Survey, Seattle; Stephen J. Reynolds, Arizona State University; Paul Morin, University of Minnesota. Fee: \$650. CEUs: 0.8.

### Managing Environmental Projects

Sat., Nov. 1. Cosponsored by *GSA Engineering Geology Division*. Raymond C. Kimbrough, P.E. LaMoreaux & Associates, Inc., Tuscaloosa, Alabama. Fee: \$500. CEUs: 0.8.

### New Satellite Data and Processing Techniques for the Field Geologist

Sat., Nov. 1. Cosponsored by *GSA Quaternary and Geomorphology Division*. Tom G. Farr, Jet Propulsion Laboratory, Pasadena, CA; John C. Dohrenwend, Southwest Satellite Imaging, Teasdale, UT. Fee: \$525. CEUs: 0.8.

## EXHIBITS

***Have you got a product to sell?***

***A new service to unveil?***

***A school or program to promote?***

The GSA Annual Meeting Exhibit Hall showcases more than 200 organizations offering the latest in scientific instrumentation; field supplies and gear; geological publications; laboratory services; gems, minerals, and fossils; and information on earth science programs at various institutions.

Find out more about our current 2003 exhibitors by visiting our Web site at [www.geosociety.org](http://www.geosociety.org). Exhibitors can reach more than 6,100 influential and key decision-makers from the geoscience community, meeting face-to-face with attendees and developing new customers, increasing sales, and educating current and potential customers on products and services. Exhibit with us in 2003—it will be a successful and rewarding experience for everyone!

For more information on becoming an exhibitor, contact Darline Daley with Quality Business Services, (303) 914-0695 or [darline@qbsoffice.com](mailto:darline@qbsoffice.com).

## Other Courses and Panels

Registration and information can be obtained from the contact person listed.

### Sequence Stratigraphy for Graduate Students

Fri.–Sat., Oct. 31–Nov. 1. Free short course for graduate students. Cosponsored by *ExxonMobil* and *British Petroleum (BP)*. Instructors: Kirt Campion (*ExxonMobil*) and Art Donovan (*BP*). Information: Kirt Campion, [kirt.m.campion@exxonmobil.com](mailto:kirt.m.campion@exxonmobil.com).

### Bridging the Gap: Trends in Ostracode Biological and Geological Sciences

Sat., Nov. 1. Sponsored by *Paleontological Society*. Organizers: Lisa Park, Dept. of Geology, University of Akron, 252 Buctel Commons, Akron, OH 44325-4101, (330) 972-7630, fax 330-972-7611, [lepark@uakron.edu](mailto:lepark@uakron.edu); Alison Smith.

### Diversity Issues in Geoscience Fields—A Panel Discussion

Mon., Nov. 3. Sponsored by *National Association of Black Geologists and Geophysicists*. Information: Conrad K. Allen, *ExxonMobil*, 396 West Greens Road, P.O. Box 4697, Houston, TX 77210-4697, (713) 431-1365, [conradallen@msn.com](mailto:conradallen@msn.com).



## K-16 PROGRAM

Attention College Faculty, K-12 Teachers, Teacher Trainers, and Pre-Service Teachers:

Look for the K-16 Education Workshops listing in the June issue of *GSA Today*.

Questions? Contact Julie Sexton at [jsexton@geosociety.org](mailto:jsexton@geosociety.org) or (303) 357-1005 for more information.

# Seattle 2003 Registration Information

Preregistration Deadline: Friday, September 26

Cancellation Deadline: Friday, October 3

Registration information will be available in the June issue of *GSA Today* and on the GSA Web site, [www.geosociety.org](http://www.geosociety.org), in early June.

Meeting registration fees have NOT been established as we go to print. However, for your budgeting and travel authorization requests, please use the *estimated* preregistration fees printed here. Final fees will be published in the June issue of *GSA Today*.

You will save a substantial amount on your registration fee by becoming a GSA member—almost exactly what you would pay to join GSA. That's like joining GSA for free! For further information, contact GSA Sales and Service at GSA headquarters, [gsaservice@geosociety.org](mailto:gsaservice@geosociety.org) or 1-888-443-4472.

## LODGING

Seattle offers high-quality, affordable hotel rooms for meeting attendees. GSA has booked rooms at 11 hotels, offering special convention rates ranging from \$73 to \$190 per night. The headquarters hotel is the Sheraton Seattle. Most activities will take place at the Washington State Convention & Trade Center and the Sheraton Seattle. Additional housing information will be included in the June issue of *GSA Today*.

## ESTIMATED REGISTRATION FEES

	Preregistration		On-Site	
	FULL MEETING	ONE DAY	FULL MEETING	ONE DAY
Professional Member	\$295	\$190	\$375	\$200
Professional Member 70 or older	\$240	\$135	\$315	\$145
Professional Nonmember	\$375	\$215	\$465	\$225
Student Member or Student Associate	\$90	\$60	\$120	\$60
Student Nonmember	\$120	\$75	\$150	\$75
Guest or Spouse	\$80	N/A	\$80	N/A
K-12 Professional	\$40	N/A	\$40	N/A
Short Course or Field Trip Only	\$40	N/A	\$40	N/A

Title Sponsor of the  
2003 GSA Annual Meeting



## Guests Invited!

Make plans now to participate in the GSA Guest Program at the Annual Meeting in Seattle, and get ready to be pampered! GSA extends a warm welcome to all spouses, family members, and friends to register for the Guest Program.

The guest or spouse registration fee of \$80 per person is for non-geologist spouses or family members and friends of professional and/or student registrants to the GSA Annual Meeting. The guest registration fee is required to attend guest activities, gain entrance to the Exhibit Hall, attend seminars and workshops (to be listed in the June issue of *GSA Today*), and take advantage of refreshments in the Guest Hospitality Suite. Formal tours (also listed in the June issue of *GSA Today*) will be offered at an additional cost. Fees cover the cost of professional tour guides, round-trip transportation, admission fees, and gratuities. Reservations for all tours will be accepted on a first-come, first-served basis. Since the tour operator requires a final guarantee weeks in advance, most tours have attendance minimums and maximums. Please register early to guarantee your spot. Tours may be canceled if minimum attendance is not met.

The guest registration fee will NOT provide access to all Technical Sessions. However, guests can sign in with the hostess in the Guest Hospitality Suite and get a Visitor Badge allowing them to attend a specific presentation.

**Guest Hospitality Suite Hours**  
Sun.–Wed., Nov. 2–5  
8 a.m.–5:30 p.m.

Registration for the Guest Program begins in June.  
Look for the *GSA Today* June issue or register online at [www.geosociety.org](http://www.geosociety.org).

## Employment Interview Service

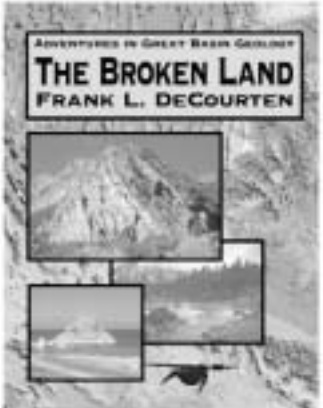
GSA will again offer its Employment Interview Service. Each year, this program, together with the Roundtable Discussions, provides valuable networking opportunities in the geosciences. For more information, contact Nancy Williams at GSA headquarters, [nwilliams@geosociety.org](mailto:nwilliams@geosociety.org) or go to the GSA Web site, [www.geosociety.org](http://www.geosociety.org).

## Student Volunteer Opportunities

If you are a geology student and are planning on attending the GSA Annual Meeting in Seattle this November, consider volunteering and save money at the same time.

As a student volunteer, you can offset some of your cost of attending the annual meeting. If you volunteer just 12 hours of your time, you get one free meeting registration. If you volunteer 15 or more hours, you get one free meeting registration and one free Abstracts with Programs volume. In addition, GSA will award student volunteers a stipend of \$20 for each 4 hours of volunteered time.


For more information, please contact Kevin Ricker at [kricker@geosociety.org](mailto:kricker@geosociety.org).



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## Graduate School Information Forum

### DON'T DELAY: RESERVE YOUR SPACE NOW!

Meet face-to-face with prospective students in a relaxed, informal setting by participating in the Graduate School Information Forum (GSIF) during the GSA Annual Meeting. Take advantage of this excellent opportunity to promote your school to over 1,500 students.

GSIF will be located in the poster session hall and in the corridor leading to it. Traffic and visibility will be outstanding this year due to this location, which is adjacent to the exhibit hall. The forum will be open Sunday through Wednesday from 8 a.m. to 5:30 p.m. You may choose from one day to all four days. Space is extremely limited, and Sunday and Monday will be the first to sell out. *Those schools reserving multiple days will be assigned first and to the most visible booths.*

Participating schools will be promoted in the October *GSA Today*, the 2003 Annual Meeting Program and—NEW THIS YEAR—on the GSA Web site, with e-mail links so prospective students may schedule appointments prior to the Annual Meeting.

A new online Graduate School Program Posting opportunity will be available later this year that can help enhance visibility during the meeting and throughout the year. Participating GSIF schools will be eligible for significant discounts. Stay tuned for further details.

For more information or to reserve your space, contact Kevin Ricker at (303) 357-1090 or [kricker@geosociety.org](mailto:kricker@geosociety.org).