THE GEOLOGICAL SOCIETY OF AMERICA
*Geoscience Education Division*
http://geosciedu.org/ Winter 2003

## A Quick Note from Your Newsletter Editor

I hope everyone is having a great 2002-2003 school year. With the bizarre El Niño weather patterns most of us have been experiencing, this winter has been a challenge. Why, here in Florida, we've actually had to wear coats! However, the weather has also provided a sterling opportunity to talk about global climate and weather patterns, so I haven't resented (too much) breaking out the winter woolies in the name of science education. This newsletter contains all the submissions given to me between August 2002 and February 2003, unless they have become outdated. Please send inquiries, suggestions, or future news items to me at <mhafen@chuma1.cas.usf.edu>.

Mark R. Hafen
University of South Florida

## Letter to the Editor - WHAT? Evolution in Genesis? YES!!

What a sad opening display? The GSA Education Division webpage features a map of 'Evolution Treatment' in state public schools. Evolution is one of THE MOST IMPORTANT theories of all science. How about introducing an antidote for this deficiency?

The "anti's" (a.k.a. "creationists"), including teenage students, argue endlessly with obfuscation, confusion, complications, negation, subversion, etc. Their basic motivation, never stated, is that Genesis states *creation*, not evolution. For them, the Bible contains truth and they will resort to any tactic to pervert evolution. The map displays the degree of their success.

The antidote is to explain how the basic PRINCIPLE of evolution, speciation, can be understood in Genesis 1. If evolution is in Genesis, then for the 'anti's', it must be true. The rest of us are convinced by the scientific evidence.

The basic explanation is in a 700+ word essay with two pictograms, which is available by e-mail at <cwinder@uwo.ca>.

Can students understand? I have explained to hundreds of undergraduates, average time three minutes. This last spring I spoke to a local secondary school in a "Science in Society" class; the teacher was intrigued by the evidence of the progressive change of ammonite sutures. A student in the same subject in another secondary school heard my analysis, and successfully presented to her class. She was confused by the available literature and said about my analysis - "Seems like common sense to me". The student is a member of the Salvation Army!

C. Gordon Winder, GSA Senior Fellow
University of Western Ontario, London Canada; <www.uwo.ca/earth/winder.htm>

## Northwest Section National Association of Geology Teachers Meeting

The Northwest Section of NAGT will meet June 17, 18, 19 in Juneau, Alaska at the University of Alaska Southeast. Pre-conference field trip: Geology and Geomorphology of the Tatshenshini and Lower Alsek Rivers (June 6-15, 2003). Contact Cathy Connor at <cathy.connor@uas.alaska.edu> or visit <http://uashome.alaska.edu/~jfclc/nagt> for more information.

## The Human Race is Going Back to Mercury!

Challenger Center for Space Science Education announces an Educator Fellowship program for educators of grades pre-K through 12, in support of NASA's MESSENGER mission to Mercury. MESSENGER (MErcury Surface, Space ENvironment, GEochemistry, and Ranging) will be only the second spacecraft to venture to the innermost planet of our Solar System. Launched in 2004, it will make two passes by the innermost planet in 2007 and 2008, and will go into orbit in 2009. MESSENGER Educator Fellows will help take the nation along for the ride. For more details, please visit www.challenger.org/ssr/new.html or contact Elizabeth Taylor at Challenger Center by e-mail <etaylor@challenger.org> or by phone at 703-683-9740 or 800-969-5747.

## JGE Manuscripts Sought

The Journal of Geoscience Education (JGE) is soliciting manuscripts for a theme issue on urban geoscience education. Please contact theme issue editor Mark Abolins <mabolins@mtsu.edu> for further information.

***Theme Issue Description***: The largest potential audience for geoscience education resides in urban and urbanizing areas. In addition, urban ethnic communities could yield recruits for geoscience diversity efforts. However, urban geoscience programs must overcome challenges including limited access to nature and perceived lack of relevance. The theme issue will include manuscripts addressing these and other challenges. Although the issue will be as inclusive as possible, authors should consider (but not be limited to) one of the following formats:

- **Overcoming challenges**. These manuscripts will examine effective urban geoscience education practices. In the introduction, the author should outline a challenge encountered by urban geoscience educators nationwide. After outlining the challenge, the author should propose a solution and describe its implementation. Detail should be sufficient to allow reproducibility. Evaluation results should be summarized (e.g., in tabular form), and the author should discuss the success and wider significance of the proposed solution. The conclusion should follow logically from the discussion.

- **Resources for Geoscience Education in the Built Environment**. These manuscripts will provide materials for direct use in urban geoscience education. Manuscripts should address topics of widespread relevance in built settings (i.e., urban and/or suburban areas). For example, contributions might include a "Citizen's Guide to Urban Stormwater," or a scientific examination of topics like urbanization, sprawl, and threatened geo-antiquities. The author should indicate the intended use of the materials (e.g., K-12, undergraduate, or informal education). When evaluating suitability for the indicated use, reviewers will consider content, pedagogy, and the responsible treatment of potentially sensitive environmental topics.

If you have developed some highly effective activities for pre-college or undergraduate students (e.g., using cemetery headstones to teach petrology), feel free to build a manuscript around the activities. A quantitative evaluation of effectiveness (e.g., improved student assessment scores) is desirable but not essential. Also, manuscripts focusing on "suburban" geoscience education are welcome. For example, an author might submit a manuscript focusing on the impact of urbanization on the environment.

***Submission Guidelines***: Submissions should be postmarked by May 1, 2003. Send four (4) copies of the manuscript to JGE with a cover letter indicating interest in the Urban Geoscience Education theme issue. Consult the JGE web site (www.nagt.org/Instructions.htm) for manuscript preparation and submission guidelines. There is no official word limit for JGE manuscripts, but manuscripts are typically between 4000-8000 words (5-10 printed pages) in length. Manuscripts should include an informative abstract of about 200 words. The anticipated publication date is January, 2004.

Mark Abolins
Middle Tennessee State University

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## Periodicals: Free to a Good Home

Take these periodicals from a geologist downsizing her library. These journal sets are offered as donations to any institution that wants them. Send an e-mail to Janet Crampton at <janet.crampton@wap.org> to discuss shipping.

*Scientific American*, 12 issues (2 volumes/yr), 1954 (v.190) through 2000 (v.283), missing May 1985 and June 1987
*Geotimes*, 2001 (v.46) and 2002 (v.47), 12 issues/year, complete
*Geology*, 12 issues/yr, 1996 (v.24) through 2001 (v.29), complete
*Bulletin of the Global Volcanism Network*, 12 issues/yr, 2000 (v.25) and 2001 (v.26), complete
*Eos, Transactions of the American Geophysical Union*, weekly, 2000 (v.81, missing nos.1,35), 2001 (v.82, missing nos.11,14,19,29,30), 2002 (v.83, missing no.15)

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## New Ph.D. Program at University of South Florida

A new joint Ph.D. program is on the fast-track for approval at the University of South Florida in Tampa. The Department of Environmental Science & Policy (ESP) and the Department of Geography have developed a proposal that should go online during either the 2003-04 or 2004-05 academic year. Students will be able to focus their studies in either discipline and will be able to take advantage of the two departments' strengths in research in karst environments, water resources, environmental policy, natural hazards, and applied GIS. For more information, contact Dr. Kevin Archer (Chair, Geography, <karcher2@chuma1.cas.usf.edu>) or Dr. Robert Brinkmann (Chair, ESP, <rbrinkmn@chuma1.cas.usf.edu>) or visit the USF College of Arts & Sciences home page at <http://www.cas.usf.edu/> and navigate to the departmental sites.

Mark Hafen, Ph.D.
University of South Florida

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## GeoSciEd IV Meeting

The organizers of the Fourth International Geoscience Education Conference wish to extend an invitation to attend the 2003 Meeting in Calgary, Alberta, Canada. The theme of the meeting is "Earth Science for the Global Community." Meeting dates are August 10-14, 2003. The meeting home page, with all the info, technical program, and abstract submission guidelines and deadlines, can be found at <http://www.geoscied.org/index.html>.

The abstract deadline is 15 March 2003. Technical sessions span the range of Geoscience Education research, so it should be a great meeting for those more than casually interested in the field. It is also a reasonably high profile international meeting and thus a rare opportunity to share research in a specialized international forum.

Eric M. Riggs, Ph.D.
San Diego State University

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## Online Courses Offered by San Jose State University

San Jose State University (SJSU) will be offering two NASA-approved online courses for teachers in fall, 2003. The ESSEA (Earth Systems Science Education Alliance) courses were developed by the Center for Educational Technologies, home of NASA's Classroom of the Future Program. SJSU will run the ESSEA online courses for high school teachers and middle school teachers in the fall.

Each course is cross-listed as a Geology class and a Science Education class (Geology 204/ Science Education 204) and yields three semester graduate credits. Both the high school and middle school courses may be taken, for a maximum of six graduate credits. Fall classes begin August 22, and registration is a breeze through SJSU's Open University.

Courses are moderated by Profs. Paula Messina, Ellen Metzger, and Richard Sedlock. For further information, contact <essea@geosun.sjsu.edu> or visit SJSU's ESSEA Website at <http://geosun.sjsu.edu/essea>.

Paula Messina, Ph.D.
San Jose State University

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## Postglacial Flooding of Bering Land Bridge: A Geospatial Animation

Geographic Information Systems (GIS) were used to create movies showing how the Bering Land Bridge evolved after the Last Glacial Maximum about 21,000 years ago. Global sea level at that time was approximately 120 m (400 ft) lower than today. The Land Bridge existed as a vast tundra plain connecting Asia and North America. As the world's glaciers and ice sheets melted over the following thousands of years, rising sea level flooded the Land Bridge, blocking migration routes for animals and humans.

The geospatial visualization was created to assist with scientific research, education, and outreach. It is based on the best available digital information and reveals large-scale patterns of shifting coastlines and environments as the land bridge evolved. For more information or to view the animation, see: <http://instaar.Colorado.edu/QGISL/bering_land_bridge>.

William Manley, Ph.D. <william.manley@colorado.edu>
INSTAAR, University of Colorado

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## Notes on the GED Election and Officers for 2002-03

We are delighted to report that Beth Wright was unanimously elected to the position of Second Vice-Chair by the approximately 17% of the voting members who cast votes in the election last fall, 111 online and 4 by paper ballot.

We regret to report that Tom Walker needed to resign as 2002-03 Chair due to losing his job when state funding for the Idaho Geological Survey was slashed. Tom is scrambling to make ends meet, just as many of us have or will at some point in our careers. Beth Wright has thus assumed the duties of Acting Vice-Chair, and Sue DeBari has assumed the duties of Acting Chair. Please see a complete list of 2002-03 GED officers at the end of this newsletter. A ballot for the election of our new Second Vice-Chair will be included in this summer's newsletter.

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## Schultz Receives Honor

Dr. Richard B. Schultz of Elmhurst College has recently been honored by being inducted into "Who's Who Among America's Teachers." Dr. Schultz is a faculty member in the Department of Geography and Environmental Planning at Elmhurst College in Elmhurst, Illinois."

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## GED Necrology

Daniel S. Turner, Littleton, Colorado. December 21, 2001

## Earth2Class Workshops

Earth2Class Workshops for Teachers at the Lamont-Doherty Earth Observatory provide opportunities for K-14 classroom teachers to interact with research scientists. The educators find out about cutting-edge investigations and techniques used by scientists, and the scientists have a mechanism for sharing their discoveries with teachers, their students and their families.

"E2C" was developed by GED member Dr. Michael J. Passow of the White Plains (NY) Schools. Working with Dr. Cristiana Assumpcao of Colegio Bandeirantes, Sao Paulo, Brazil, and Frederico Baggio of Baggio Technologies, Sao Paulo, Dr. Passow and the scientists provide web-based versions of this program at <www.earth2class.org>. The Lamont-Doherty Earth Observatory provides facilities support and encouragement.

Each session begins with background information about the session's geoscience theme presented by Dr. Passow, followed by the guest scientist(s). In the final section of each program, participants have the opportunity to work though classroom applications of these ideas. Some of these involve teacher training materials developed by the American Meteorological Society Education Program, while others have been created by participants.

In the current academic year, the themes and guest scientists include:

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| Sep 28 | PAST, PRESENT AND FUTURE OF OCEAN DRILLING – Dr. Gerardo Iturrino |
| Oct 26 | REMOTE SENSING OF THE EARTH AND TERRESTRIAL PLANETS – Dr. Christopher Small |
| Nov 16 | IDENTIFYING AND MITIGATING HAZARDS – Dr. Arthur Lerner-Lam and Dr. Robert Chen, CIESIN |
| Dec 14 | IMPACT CRATERS UNDER THE SEA – Dr. Dallas Abbott |
| Jan 11 | A RIVER RUNS THROUGH IT: THE HUDSON AND OUR LIVES – Dr. Robin Bell and Dr. Martin Visbeck |
| Feb 15 | CORES AND CLIMATE CHANGES – Dr. Gerard Bond and Rusty Lotti (Curator, LDEO Deep-Sea Core Repository) |
| Mar 8 | THE "MARGINS" PROJECT – Dr. Jeffrey Weissel |
| Apr 12 | ARSENIC IN THE GROUNDWATER OF BANGLADESH – Dr. Alexander Van Geen |
| May 10 | WATER RESOURCE ISSUES – Dr. Upmanu Lall |

Participants come from a variety of schools in the New York/New Jersey region, as well as from Carroll County Community College, MD. Most receive professional development credit from their districts. Graduate academic credit is available through Teachers College, Columbia University, and St. Thomas Aquinas College, Sparkill, NY.

Dr. Michael J. Passow
White Plains (NY) Schools

## Visualizations Available

As part of the NSF-funded Hidden Earth Curriculum Project, Steve Reynolds of Arizona State University has created some more striking visualizations, such as the new Biosphere 3D site, which contains QTVR movies that have spinnable globes showing climatic factors, ocean currents, wind, etc., draped over digital topography of the Earth. They are available at <http://reynolds.asu.edu>.

## TOPICAL SESSION AT GSA SEATTLE - I

We are looking for contributors for a Topical Session at the 2003 GSA meeting in Seattle entitled "Overcoming Obstacles to Incorporating Experiential Learning into the Undergraduate Geoscience Curriculum." Geoscience professors have a strong record of incorporating experiential learning into the undergraduate curriculum. However, the limitations of the traditional academic setting present problems for professors who try to do more than lecture and run the standard college labs. This session will focus on how contributors have overcome the variety of obstacles that post-secondary educators encounter in their attempts to incorporate active learning. Examples of obstacles include: scheduling, funding, lack of administrative support, legal issues, student expectations of passive learning, instructor preparation time and effort, land access issues, including students with disabilities, community attitudes, and other logistics. We are especially interested in solutions that could create a long-term departmental or institutional change in the learning climate. For more information, please contact Robert Thomas or Sheila M. Roberts of the University of Montana-Western at <r_thomas@umwestern.edu> or <s_roberts@umwestern.edu>. The due date for submitting electronic abstracts to GSA is July 15, 2003.

Robert C. Thomas, Ph.D.
The University of Montana-Western

## TOPICAL SESSION AT GSA SEATTLE - II

Topical session "Subliminal and Intentional Outreach: Educating the General Public about Geological Sciences Through Novels, Film, TV, and Other Public Media" has been accepted as Topical Session Number 31 for the technical program for the GSA meeting in Seattle. Please contact Bonnie Blackwell at <Bonnie.A.B.Blackwell@williams.edu> for details.

## A New "Concept" in Geosciences Assessment

In 2001, the Assessment of Student Achievement in Higher Education program in the Division of Undergraduate Education at the National Science Foundation (NSF) awarded a grant to three institutions for the study of college student ideas about the Earth. The research team, headed by Julie Libarkin of the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, Steven Anderson of Black Hills State University in Spearfish, South Dakota, and William Boone of Indiana University-Bloomington, are using this research to develop a valid and reliable assessment tool for use in college-level Earth science courses. In addition, the team has expanded to include several graduate students, including Meredith Beilfuss at Indiana University-Bloomington and Julie Dahl at Black Hills State University. Meredith is working on a study of conceptions and cognition as portrayed in student drawings. Julie is focusing on the ideas held by in-service teachers, particularly those ideas related to state science standards.

The research team has narrowed the focus of the study to three aspects of Earth science: Geologic time, the Earth's interior, and the Earth's surface. Student ideas have been gathered with open-ended questionnaires and interviews, providing a look into both student conceptions and mental models. Ideas contrary to the accepted scientific perspective are used as "incorrect" responses on a simple multiple-choice test, allowing a choice between the "correct" scientific perspective and authentic incorrect responses. The development of this multiple-choice test, the Geoscience Concept Test (GCT), involved extensive collaboration with the geologic and science education community. In particular, scientists and science educators acted as reviewers, providing valuable feedback about the format of the test. Geoscience faculty also acted as an expert population, taking the initial version of the test and ensuring that experts score as predicted with near-perfect scores.

In Fall 2002, ~2500 students from 32 institutions across the country participated in the study. This data set is now being evaluated statistically, primarily through an Item Response Theory analysis. This analysis will allow a quantitative determination of validity. In addition to the expert comments and testing, further qualitative validation is provided by Think-Aloud interviews, wherein students reflect upon their reasons for choosing specific responses to each test question. We hope to complete both phases of validation shortly, and provide an initial version of this assessment tool to the geologic community for Fall 2003. This assessment can be used in two ways: 1) As a diagnostic at the beginning of a semester or course of study, whereby faculty can determine the types of ideas held by students in their entry-level geoscience courses; faculty can then use this information to modify their course, if necessary, to address these preconceptions; and 2) As an assessment tool. Faculty can compare pre- and post-test results to evaluate the effectiveness of a course for helping students obtain scientific conceptions. We hope that the availability of a valid and reliable assessment tool will assist faculty in creating courses and curricula that maximize learning.

If you would like more information about this study or would like to participate in future test development, please contact Julie Libarkin at:

Science Education Department
Harvard-Smithsonian Center for Astrophysics
60 Garden St. MS-71
Cambridge MA 02138
(617) 496-4795

Julie Libarkin, Harvard-Smithsonian Center for Astrophysics
Julie Dahl, Black Hills State University

## Graduate Certificate in GIS Offered

Applications are now being accepted for enrollment in the Fall of 2003 for the Graduate Certificate in GIS at the University of South Florida. Application deadline is May 31st 2003. The GIS Certificate Program is intended for those who have a Bachelor degree in a relevant field, recent coursework and/or work experience in GIS, and have an interest in using GIS as a problem solving tool. USF is also offering continuing education courses in GIS, including an introductory level course that meets the entrance requirements for the certificate program. For more details, follow the links on the USF-Geography web site: <http://www.cas.usf.edu/geography/gis/>

## Your 2002-2003 Geoscience Education Division Officers and Contacts

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