

integrate research and education. We will also highlight the role scientists play in finding ways to successfully partner with different constituencies, from educators to the private sector, to bring the best technology to the students desktop.

ED12A-0167 1330h POSTER

Using Volunteer Data in Scientific Research: Combining GLOBE and USGS Data to Relate Surface Water Alkalinity With Regional Geology

Martha H Conklin¹ (520-621-5829; martha@hwr.arizona.edu)

Jean C Morrill¹ (520-626-4601; jean@hwr.arizona.edu)

Roger C Bales¹ (520-621-7113; roger@hwr.arizona.edu)

Jonathan Whitter¹ (jwhit@hwr.arizona.edu)

Ray Brice¹ (ray@hwr.arizona.edu)

¹Hydrology and Water Resources, P.O. 210011 University of Arizona, Tucson, AZ 85721-0011, United States

Many volunteer datasets lack the spatial or temporal coverage necessary to make them useful to researchers without supplemental data. Alkalinity data from 35 GLOBE (Global Learning and Observation to Benefit the Environment) and 619 USGS (United States Geological Survey) surface water quality sites were compared with each other and the large-scale regional geology. Past analyses of GLOBE data, collected mostly by K 12 students, have shown that the majority of water sites tend to have lower alkalinity than observed at professionally monitored sites, but this may be a function of stream size rather than sampling error. GLOBE data tends to come from smaller streams than those monitored by the USGS, and thus represent a different sampling population. Both datasets displayed the same geographic trends in alkalinity, but the greater number of USGS sites made the trends easier to visualize spatially. The alkalinity of natural water in a region should reflect the geology of an areas bedrock, which provides the source material for mineral weathering. This is especially true for rivers, which integrate over an area, but should be reflected also in many smaller streams that drain representative parts of a basin. GLOBE and USGS observations were both consistent with the regional geology in all areas of the United States except the southeast, where either the mineralogy of silicate sedimentary layers deposited over the carbonate bedrock is a more important influence, or acidic precipitation and deposition has destroyed the buffering capacity of the water. This paper examines how GLOBE water quality data compares with and can be used in regional studies to supplement professional data. The example research project shows how teachers and students can compare their data with outside data, integrate different datasets using GIS, and use them together to understand one of the basic principles of hydrogeology.

ED12A-0168 1330h POSTER

DLESE and Data Access for the Educational Community

Thomas M. Boyd¹ (303-497-2650; tboyd@ucar.edu)

Mary R. Marlino² (303-497-8350; marlino@ucar.edu)

Benedict A. Domenico³ (303-497-8631; ben@ucar.edu)

Tamara S. Ledley⁴ (617-873-9658; tamaraledley@terc.edu)

¹Colorado School of Mines and the DLESE Program Center, University Corporation for Atmospheric Research (UCAR), PO Box 3000, Boulder, CO 80307-3000, United States

²DLESE Program Center, University Corporation for Atmospheric Research (UCAR), PO Box 3000, Boulder, CO 80307-3000, United States

³Unidata Program Center, University Corporation for Atmospheric Research (UCAR), PO Box 3000, Boulder, CO 80307-3000, United States

⁴TERC, 2067 Massachusetts Avenue, Cambridge, MA 02140, United States

The content delivered by a digital library serving the needs of the Earth system education community, particularly one whose mission is to promote active student-centered learning, must facilitate learner access to data that we as earth scientists find vital. Much of these data, however, must be extracted from, or processed as, a very large dataset that is intended for use in near real time, and which requires the use of visualization and processing tools to fully exploit. Hence, such datasets are difficult to access and use by anyone other than disciplinary researchers.

The DLESE Dataset Working Group (DAWG) is exploring what it means to incorporate datasets into a digital library with an educational mission. In particular, the DAWG is charged with addressing how DLESE can 1) facilitate discovery across distributed data archives, 2) provide tools to help instructors and learners parse, process, and visualize datasets, 3) facilitate the integration of seemingly disparate datasets, and 4) facilitate the development and dissemination of educational content that utilizes datasets and datasets.

In this presentation, we highlight both the similarities and differences in the needs of the research and educational communities, define the role of DLESE in providing data access within the educational community, provide an overview of activities of the Dataset Working Group, and describe synergistic initiatives that are working in concert with DLESE's Dataset Working Group. These initiatives include the Earth Exploration Toolbook, a collection of resources highlighting how to use specific datasets, and tools and educational products that make use of those datasets in the classroom, being developed by T. Ledley and P. Morin, and the Thematic Realtime Environmental Data Distributed Services (THREDDS) system, an infrastructure and protocol for the development and dissemination of context-specific datasets and tools, being developed at the Unidata Program Center.

URL: <http://www.dlese.org/people/workgroups/dawg/index.html>

ED12B MC: Hall D Monday 1330h

Earth System Science Education Alliance: Inquiry-Based, On-Line Learning Communities (joint with PA)

Presiding: T Schwerin, Institute for Global Environmental Strategies (IGES); B Myers, Wheeling Jesuit University

ED12B-0169 1330h POSTER

ESSEA: Overview and Opportunities to Participate

Theresa G. Schwerin (1-703-312-0825; theresa_schwerin@strategies.org)

Institute for Global Environmental Strategies, 1600 Wilson Blvd., Suite 901, Arlington, VA 22209, United States

The Earth System Science Education Alliance (ESSEA) is a partnership between the Institute for Global Environmental Strategies (IGES) and the Center for Educational Technologies (CET) at Wheeling Jesuit University, through funding from NASA's Earth Science Enterprise. ESSEA is supporting universities, colleges, and science education organizations in offering Earth system science online graduate courses that have been developed within the CET at Wheeling Jesuit University. The courses have been successfully implemented for both in-service and pre-service teacher education.

An annual announcement by ESSEA solicits proposals from US teams interested in offering the courses. Currently 12 institutions from across the US are offering the courses, with plans to select and fund 8 new organizations in February 2002. This presentation will provide an overview of the ESSEA program and information on how to participate in ESSEA.

URL: <http://www.strategies.org/essea>

ED12B-0170 1330h POSTER

Overview of the Earth System Science Education Alliance Online Courses

James A. Botti (1-304-243-4324; jbotti@cet.edu)

Center for Educational Technologies Wheeling Jesuit University, 316 Washington Avenue, Wheeling, WV 26003, United States

Science education reform has skyrocketed over the last decade in large part thanks to technology and one technology in particular, the Internet. The World Wide Web has opened up dynamic new online communities of learners. It has allowed educators from around the world to share thoughts about Earth system science and reexamine the way science is taught.

A positive offshoot of this reform effort is the Earth System Science Education Alliance (ESSEA). This partnership among universities, colleges, and science education organizations is led by the Institute for Global Environmental Strategies and the Center for Educational TechnologiesTM at Wheeling Jesuit University. ESSEA's mission is to improve Earth system science education.

ESSEA has developed three Earth system science courses for K-12 teachers. These online courses guide teachers into collaborative, student-centered science education experiences. Not only do these courses support teachers professional development, they also help teachers implement Earth systems science content and age-appropriate pedagogical methods into their classrooms.

The ESSEA courses are open to elementary, middle school, and high school teachers. Each course lasts one semester. The courses begin with three weeks of introductory content. Then teachers develop content and pedagogical and technological knowledge in four three-week learning cycles.

The elementary school course focuses on basic Earth system interactions between land, life, air, and water. In week A of each learning cycle, teachers do earth system activities with their students. In week B teachers investigate aspects of the Earth system – for instance, the reason rocks change to soil, the relationship between rock weathering and soil nutrients, and the consequent development of biomes. In week C teachers develop classroom activities and share them online with other course participants.

The middle school course stresses the effects of real-world events – volcanic eruptions, hurricanes, rainforest destruction – on Earth's lithosphere, atmosphere, biosphere, and hydrosphere. Teachers team during week A of each cycle to research the effect of each event on individual spheres. In week B groups "jigsaw" to study the interactions between events, spheres, and positive and negative feedback loops. In week C teachers develop classroom activities.

The high school course uses problem-based learning to examine critical areas of global change, such as coral reef degradation, ozone depletion, and climate change.

The ESSEA presentation provides examples of learning environments from each of the three courses.

URL: <http://www.cet.edu/essea>

ED12B-0171 1330h POSTER

Problem-Based Learning and Earth System Science The ESSEA High School Earth System Science Online Course

Robert J. Myers¹ (1-304-243-2368; bmyers@cet.edu)

James A. Botti¹ (1-304-243-4324; jbotti@cet.edu)

¹Wheeling Jesuit University, Center for Educational Technologies 316 Washington Avenue, Wheeling, WV 26003, United States

The high school Earth system science course is web based and designed to meet the professional development needs of science teachers in grades 9-12. Three themes predominate this course: Earth system science (ESS) content, collaborative investigations, and problem-based learning (PBL) methodology. PBL uses real-world contexts for in-depth investigations of a subject matter. Participants predict the potential impacts of the selected event on Earth's spheres and the subsequent feedback and potential interactions that might result. PBL activities start with an ill-structured problem that serves as a springboard to team engagement. These PBL scenarios contain real-world situations. Teams of learners conduct an Earth system science analysis of the event and make recommendations or offer solutions regarding the problem. The course design provides an electronic forum for conversations, debate, development, and application of ideas.

Samples of threaded discussions built around ESS thinking in science and PBL pedagogy will be presented.

ED12B-0172 1330h POSTER

Facilitation of the ESSEA On-Line Course for Middle School Teachers: A Key to Retention and Learning

William Slattery (1-937-775-3455; william.slattery@wright.edu)

Wright State University, Departments of Geological Sciences and Teacher Education 3640 Colonel Glenn Highway, Dayton, OH 45435, United States

There are fundamental differences between an on-line course and a traditional face to face classroom course offering. On-line courses are front-loaded, that is, students taking on-line courses first have to navigate an unfamiliar website as they become familiar with the organization of the course. In addition, students in an on-line course in many cases have the stress of having to relate with an instructor and collaborate with colleagues that they may never meet. Many may be unfamiliar with the use of telecommunications technology. These forces can combine to produce students that become disillusioned with the on-line learning process, and consequently drop the course.

The stress associated with an on-line course can be significantly reduced by the methods used by the facilitator of the course. Therefore, facilitation of an on-line course can be a key to student retention in on-line

courses, and strengthen learning experiences for all students. The Earth System Science Education Alliance on-line course for practicing middle school teachers begins with a three week non-graded module designed to permit the facilitator and students to introduce themselves, provides opportunities to participants to explore the website, and allows participants to practice working with each other to develop Earth systems interactions. These group products are evaluated by the facilitator, and returned with detailed comments to the participants. Once graded work begins during the fourth week of the on-line course, it is guided by rubrics that assign higher value to products that contain multiple examples of supporting evidence of scientific assertions, are accurate, and express depth of reasoning. The facilitator guides participant learning through group threaded discussions, providing feedback for individual journal entries, and on-line comments and suggestions regarding classroom activities developed by the participants.

Post-course evaluations suggest that K-12 teacher participants in the on-line Earth systems science course increase their content knowledge of Earth system science, develop proficiency in the use of telecommunications technology, and use the activities developed in the on-line course in their own classrooms. Their responses to evaluation instruments also indicate that the un-graded introductory module and facilitator support is critical to their success in the course.

ED12B-0173 1330h POSTER

ESSEA On-Line Courses and the WestEd Eisenhower Regional Consortium (WERC)

Elizabeth Rognier (1-415-615-3214;
lrognier@wested.org)

WestEd, 730 Harrison Street, San Francisco, CA 94107, United States

The WestEd Eisenhower Regional Consortium (WERC) is in its second year of offering two Earth Systems Science On-line Graduate courses from IGES - one for High School teachers, and one for Middle School teachers. These high-quality courses support WERC's commitment to "supporting increased scientific and mathematical literacy among our nation's youth through services and other support aimed at enhancing the efforts of those who provide K-12 science and mathematics education."

WERC has been able to use its EdGateway on-line community network to offer these courses to environmental education and science teachers nationwide. Through partnerships with the North American Association for Environmental Education (NAEEE), the National Environmental Education Advancement Project (NEEAP), and other regional, state and local science and environmental education organizations, WERC has a broad reach in connecting with science educators nationwide. WERC manages several state and national listservs, which enable us to reach thousands of educators with information about the courses. EdGateway also provides a private online community in which we offer the courses.

WERC partners with two Master Teachers from Utah, who facilitate the courses, and with the Center for Science and Mathematics Education at Weber State University, who provides low-cost graduate credit for the courses. Our students have included classroom teachers from upper elementary through high school, community college science teachers, and environmental science center staff who provide inservice for teachers. Educators from Hawaii to New Jersey have provided diverse personal experiences of Earth Systems Science events, and add richness to the online discussions. Two Earth Science Experts, Dr. Rick Ford from Weber State University, and Dr. Art Sussman from WestEd also contribute to the high caliber of learning the students experience in the courses. (Dr. Sussman's book, *Dr. Art's Guide to Planet Earth*, is used as one of the texts for our courses.)

This is our first effort in offering online courses, and we are learning valuable lessons about recruitment, retention, team-building, and facilitating discussions for classes with no "face to face" component. This format is both rich and challenging, with teammates from diverse geographic regions and timezones, with a variety of connectivity and accessibility issues. In this second year of offering the courses, we are pleased to have students referred by former participants, anxious to take this "highly recommended" course!

ED12B-0174 1330h POSTER

The Teaching-Learner Relationship in Online Learning

Wes Snyder (1-406-243-5358;
Conradwsnyder@aol.com)

University of Montana, James E. Todd Building, Missoula, MT 59812, United States

Dismal displays of scientific knowledge among students are decry regularly in the press and among parents and employers in their discussions about the impact of schooling. What learning occurs appears

to be fragile and temporary, at best aimed at short-term test performances but usually unrelated to life experiences. Fragile learning contains many errors of understanding, is subject to naive application, is inert and usually unused, and fails to replace core primary meanings that are unsubstantiated and misleading. When such learning is either a result of or accidentally encouraged by teaching practices, then the problems can be addressed through professional development activities. American education has undergone considerable scrutiny due to low scores on international science tests, and the teaching of science has received considerable attention. However, Montana represents a special case. Students at the 8th grade level in Montana rank second on science and mathematics tests in the USA in the National Assessment for Educational Progress (NAEP) and would rank among the best in the world if equated to the Third International Math and Science Study (TIMSS) scores. Even within this successful schooling environment, many rural classes that serve Native American students feature low test scores, low expectations for continuing education, and students who are largely disinterested in modern science or its importance for everyday life. Therefore, the Montana schooling context includes both successful and unsuccessful programs, and it represents an excellent source for information on the role of online instruction for inservice training and the impact of technology that results in the classroom from the training.

ED12B-0175 1330h POSTER

Hampton University and the ESSEA On-Line ESS Courses: A Unique Partnership of Educators and Scientists

Dianne Robinson (1-757-727-5869;
dianne.robinson@hamptonu.edu)

Hampton University, Interdisciplinary Science Center
PO Box 6142, Hampton, VA 23668, United States

Earth System Science Online is an innovative web-based science course for teachers and future teachers. Supported by NASA and offered by the Interdisciplinary Science Center at Hampton University, this course targets students interested in an asynchronous web-based learning environment. Earth System Science Online allows participants to earn three hours of science graduate credit through their online explorations of the geosphere, hydrosphere, and atmosphere. The incorporation of specific problems-based case studies, allow students to investigate weather phenomena, deforestation, and the various instruments and satellite data systems that are used to collect and analyze this data.

This newly initiated web-based course delivers all lectures, text readings, and course assignments online. Assignments are given on a weekly basis, and participants are expected to conduct independent research that will enrich their online experience. The nature of the web allows registered participants to easily integrate text and graphics into their assignments and have access to their classmate's work. Participants meet online weekly and interact as a team. Team members take advantage of Hampton University's leadership in atmospheric sciences by meeting online to discuss course content with faculty and guest experts.

Hampton University, a Historically Black University (HBCU), has built a unique partnership between the scientists at the Center for Atmospheric Sciences and the educators at the Interdisciplinary Science Center. Both centers work closely together and partner with NASA to provide outreach efforts for several NASA satellite-based research missions. The ISC has been recognized for the quality of its professional development for teachers for over eighteen years. Earth System Science Online brings together a unique partnership of educators and scientists providing an innovative online course for teachers.

ED12B-0176 1330h POSTER

Plans of Implementation and Methods for Increasing Student Enrollment in the Earth Systems Science Course at Elizabeth City State University

William Porter (1-252-335-3378;
waporter@mail.ecsu.edu)

Elizabeth City State University, Box 675, 1704
Weeksville Road, Elizabeth City, NC 27909, United States

This presentation reviews the experience of Elizabeth City State University (ECSU) in offering the Earth Systems Science (ESS) online course sponsored the Earth System Science Education Alliance (ESSEA) and how it relates to our plans to offer the course in the Spring Semester of 2002. The course was offered for the first time at ECSU during the Fall semester 2000. Eight students were enrolled in the course, which may not be considered a large number; however, we felt the administration of the course was successful because of the staff's learning experience. The small number is also

a reflection of the nature of ECSU's primary recruitment region of northeastern North Carolina; this area is extremely rural with a smaller population, lower economic development, and fewer cultural amenities than most regions of the state. Our approach to this project is for a long-term effective offering of a course that is much needed, especially in this area of the state. The ultimate goal is to develop ESS as our online offering of courses in the Geoscience Department curriculum as to recruit students who might not have the opportunity to take college-level courses because of daytime work commitments and/or inaccessibility to a local college or university.

A major component of ESS is its focus on problem-based learning built upon the life experiences of participating students. Having learned from the previous offering of the course, the following are objectives related to the Spring Semester 2002:

1. To get ESS to become a part of the Geoscience curriculum so that it will be listed on the schedule of classes for the Spring Semester 2002 and each succeeding semester;
2. To aggressively reach out to the public school teachers, especially in the recruitment region of ECSU in northeastern North Carolina, by using effective recruitment strategies;
3. To have an active and continuous communication with prospective students prior to and immediately after the enrollment, as well as being accessible to them during the entire period of the course; and
4. To have students focus on the problem-based aspect of the course as it relates to their life experiences.

These objectives are designed to increase enrollment in the course as well as to enhance the retention of participating students.

ED12B-0177 1330h POSTER

Student Engagement and Empowerment Through Earth System Science

Russanne Low¹ (1-612-625-2505; rlow@cce.umn.edu)

Douglas Schnurrenberger² (1-612-626-7889;
schno005@tc.umn.edu)

¹Science CenterUM, University of Minnesota, 310 Pillsbury Drive, SE, Minneapolis, MN 55455, United States

²Limnological Research Center, University of Minnesota, 310 Pillsbury Drive, SE, Minneapolis, MN 55455, United States

Through ESSEA's curricula, we promote empowerment of our diverse student body through access to excellence in science education and technology. Global change, by virtue of its economic relevance and environmental urgency, engages students in science inquiry. Global change is emerging as a political issue as countries with fewer resources are less able to buffer their economic systems from hardships resulting from climatic change. The ESS and global change emphasis facilitates in-depth classroom examination of the social ramifications of science and technology as required by Minnesota's state science standards. Access to ESSEA courses for in-service teachers is promoted by several programmatic initiatives of the University of Minnesota. High school and undergraduate versions of the on-line course are now in development. Summer research experiences for teachers, research projects by secondary classrooms tracking local environmental change, and involvement of graduate student scientists as on-line mentors of the ESSEA courses are components of a broader program that is building a multidisciplinary science-based learning community in Minnesota. ESSEA is the flagship program of Science CenterUM, a consortium of science and education colleges at the University of Minnesota promoting excellence in science education through content-based professional development for K-12 educators.

ED12B-0178 1330h POSTER

Gerry W. Simila¹ (818-677-3543; gsimila@csun.edu)

Barbara A. Hawkins² (barbara.a.hawkins@csun.edu)

¹Department of Geological Sciences, CSUN, 18111 Nordhoff St., Northridge, CA 91330

²Department of Elementary Education, CSUN, 18111 Nordhoff St., Northridge, CA 91330

Initially, the Departments of Geological Sciences and Education cooperated to revise the existing Earth Science and Geology preservice courses for both the elementary and secondary pre-credential majors. The main objective of this collaboration was to promote the growth of knowledgeable and well-equipped K-12 Earth system science future teachers. Now, both Departments, in cooperation with the College of Extended Learning, have instituted The Earth System Science Education Alliance (ESSEA) On-line Professional Development Program of Earth System Science curriculum developed by the Center for Educational Technologies (CET) at Wheeling Jesuit University. These graduate courses have been offered in our first year to teachers of K-4, 5-8, and 9-12 that were selected from the Los Angeles Unified School District (LAUSD) and other local schools. Our team also consists of master science teachers selected from local elementary and

high schools. Our project also involves the incorporation of the new California Science Standards, as well as NASA's Strategic Enterprises: the Earth Science Enterprise (ESE) and the Space Science Enterprise (SSE). We will also present various aspects of our experiences in online instruction.

ED21A MC: Hall D Tuesday 0830h

Women in the Geosciences: Developments, Current Status, and Outstanding Challenges (joint with PA)

Presiding: M K McNutt, Monterey Bay Aquarium Research Institute; J Giesler, AGU

ED21A-0188 0830h POSTER

An Analysis of Gender Differences in Recent Earth and Space Science PhD Graduates

Jennifer Giesler (202-777-7512; jgiesler@agu.org)
American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC 20009, United States

The American Geophysical Union (AGU) and the American Geological Institute (AGI) have been collecting data on recent PhDs in the geosciences for 5 years (1996-2000). The 1999-2000 PhD classes were combined for an increased sample size and analyzed for gender differences. Other than salary, place of employment, and job search methodology no differences were found. Females had salaries that were slightly lower than those of their male counterparts. This might be due to the fact that there are a greater number of female postdoctoral candidates 47% compared to males 40%. Place of employment tended to be similar with fewer women in industry and a higher number of recent female PhD graduates in the academic sector. Interestingly, men and women differed in the ways in which they found their first job. A higher percent of men reported they felt their advisor was helpful in their job search (52% for men and 50% for women). Women used electronic resources at a higher rate (17.3%) than men (12.1%) and 33.6% of the women felt their scientific society was helpful in their job search, compared to only 24.1% of the men.

ED21A-0189 0830h POSTER

Retention of Women in Geoscience Undergraduate and Graduate Education at Caltech

Claudia J. Alexander ((818)393-7773; calexand@pop.jpl.nasa.gov)
Jet Propulsion Laboratory, 4800 Oak Grove Dr., Pasadena, CA 91740

Institutional barriers encountered by women in undergraduate and graduate schools may take many forms, but can also be as simple as a lack of community support. In the 1990s the California Institute of Technology (Caltech) made a commitment to the retention of women in their graduate and undergraduate schools. Their program included mentoring, focused tutoring, self-esteem support groups, and other retention efforts. Under this program, the attrition rate of women has dramatically slowed. In this paper, we will discuss recent data from the American Geological Institute chronicling the enrollment and successes of women in the geosciences, the program instituted by Caltech, possible causes of attrition among women in the geosciences, as well as potential programs to address these problems. We will also present, from the nationwide study, data on geoscience departments which have been relatively successful at retaining and graduating women in Earth and Space Sciences.

ED21A-0190 0830h POSTER

Mixing a Career in the Geosciences with Real Family Life: One Woman's Perspective

Roberta M Johnson (303 497 2591; rmjohnsn@ucar.edu)
University Corporation for Atmospheric Research, P.O. Box 3000, Boulder, CO 80307, United States

A career in the geosciences can offer many exciting opportunities for discovery, challenges, and rewards. The question is, can a successful career in our field be mixed with a full family life including spouse, children, and other family responsibilities? As a mother of three young children, married to a geoscientist, I have

worked for over a decade to find a balance between a full time job and family responsibilities. This presentation will highlight some of the career management techniques that can be used to attempt to balance these competing priorities for dual career couples. Additionally, structural barriers that hamper opportunities for female geoscientists to progress will be discussed. Finally, the positive effects of the development of family friendly policies within professional societies and at places of employment will be highlighted.

ED21A-0191 0830h POSTER

Numbers of women faculty in the geosciences increasing, but slowly

Cecily J Wolfe (808-956-5228; cecily@soest.hawaii.edu)
University of Hawaii at Manoa, Hawaii Institute of Geophysics and Planetology 1680 East West Road POST 819E, Honolulu, HI 96822, United States

Why are there so few women faculty in the geosciences, while there are large numbers of women undergraduate and graduate students? According to National Science Foundation (NSF) estimates for 1995 in the Earth, atmospheric, and oceanic sciences, women made up 34% of the bachelor's degrees awarded, 35% of the graduate students enrolled, and 22% of the doctorates granted. Yet progress has been slower in achieving adequate representation of women geoscientists in academia, where women represent only 12% of the overall faculty. This talk will present the results of a survey I conducted on the status of women faculty at the 20 top-ranked geology programs, which was originally published as a feature article in *Eos* [Wolfe, 1999]. Data from the 1997 AGI Directory of Geoscience Departments were used to compare the numbers of women faculty at different departments, as well as to consider the distribution of men and women faculty by year of Ph.D. Strong inequities were found to exist between the individual departments. The percentages of women in the departments ranged from 0% of the departments had either one woman faculty member or none. Histograms of the faculty sorted by year of Ph.D. showed that clear generational differences existed between the sets of men and women faculty. Thirty-nine percent of the men obtained their Ph.D. prior to 1970, whereas only 3% of the women obtained their Ph.D. before this date. The majority of women faculty members (64%) received their Ph.D. after 1980, but a minority of men (31%) received their degrees after 1980. In the 1960s and 1970s, the geosciences expanded and departments employed a high percentage of recent Ph.D.s, but hiring of young faculty decreased in the 1980s and 1990s. In contrast, the numbers of women graduate students only began to rise after 1970, and thus the quantity of women Ph.D.s increased as the number of young hires decreased. Two problems appeared evident from this study using 1997 data. Women faculty were unevenly distributed among top-ranked departments, and the limited employment situation was another factor impeding the advancement of women in academia.

ED21B MC: Hall D Tuesday 0830h

Diversity and Geoscience Societies: Sharing Our Mutual Interests (joint with PA)

Presiding: R Johnson, UCAR/NCAR; F Hall, University of New Orleans

ED21B-0192 0830h INVITED POSTER

DIVERSITY IN THE GEOSCIENCES: ISSUES, INFORMATION, AND THE ROLE OF THE AMERICAN GEOPHYSICAL UNION

Frank R Hall¹ (504-280-6325; frhall@uno.edu)

Roberta Johnson² (303-497-2173; rmjohnsn@ucar.edu)
¹University of New Orleans, Dept. of Geology Geophysics, New Orleans, LA 70148, United States
²University Center for Atmospheric Research, P.O. Box 3000, Boulder, CO 80307, United States

As a field of study, the geosciences have lagged behind other fields of science and engineering in terms of improving diversity. The proportions of women and racial and ethnic minorities entering the field is also significantly lower than their proportions in the general population. For women, this is particularly true at the Masters and Doctoral levels whereas racial and ethnic minorities are disproportionately low from the entry or Bachelors degree level. In this presentation, we discuss the more than 25 years of data on diversity within geoscience and compare it with other sciences. In addition,

we will look at how these data compare with present and projected population trends in the United States. We will examine factors that may be responsible for the disproportionately low representation of women and minorities in the geosciences, and also discuss how these trends can affect geoscience industries and academic geoscience departments. Finally, we will examine the efforts of the American Geophysical Union to improve diversity in the geosciences, including the recent establishment of its first Subcommittee on Diversity of the Committee on Education and Human Resources.

ED21B-0193 0830h INVITED POSTER

The American Geological Institute Minority Participation Program

Michael J Smith¹ (207-230-0046; msmith@agiweb.org)
Gary R Byerly² ((225) 388-5318; gary@geol.lsu.edu)
Caitlin N Callahan¹ (703-379-2480; cnc@agiweb.org)
¹American Geological Institute, 4220 King Street, Alexandria, VA 22302-502, United States
²Louisiana State University, Department of Geology and Geophysics, Baton Rouge, LA 70803, United States

Since 1971, the American Geological Institute (AGI) Minority Participation Program (MPP) has supported scholarships for underrepresented minorities in the geosciences at the undergraduate and graduate levels. Some of our MPP scholars have gone on to hugely successful careers in the geosciences. MPP scholars include corporate leaders, university professors, a NASA scientist-astronaut and a National Science Foundation (NSF) CAREER awardee. Yet as ethnic minorities continue to be underrepresented in the geosciences, AGI plans to expand its efforts beyond its traditional undergraduate and graduate scholarships to include diversity programs for secondary school geoscience teacher internships, undergraduate research travel support, and doctoral research fellowships. Funding for the MPP has come from multiple sources, including industry, scientific societies, individuals, and during the last 10 years, the NSF. College-level students apply for the MPP awards or award renewals, and the MPP Advisory Committee selects scholarship recipients based upon student academic performance, financial need, and potential for success as a geoscience professional. Mentoring is a long-standing hallmark of the AGI MPP. Every AGI MPP scholar is assigned a professional geoscientist as a mentor. The mentor is responsible for regular personal contacts with MPP scholars. The MPP Advisory Committee aims to match the profession of the mentor with the scholar's academic interest. Throughout the year, mentors and scholars communicate about possible opportunities in the geosciences such as internships, participation in symposia, professional society meetings, and job openings. Mentors have also been active in helping younger students cope with the major changes involved in relocating to a new region of the country or a new college culture. We believe that AGI is well-positioned to advance diversity in the geosciences through its unique standing as the major professional organization in the geosciences. AGI maintains strong links to its 37 professional Member Societies, state and federal agencies, and funding programs, many with distinctive programs in the geoscience education. AGI Corporate Associates have consistently pledged to support diversity issues in geoscience education. Current plans include seeking funding for 48 undergraduate awards at \$2500 each and \$24,000 to support undergraduate travel to professional meetings. We also expect to increase the size of our graduate scholarship program to 30 students and raise an additional \$30,000 to support graduate travel to professional meetings.

URL: <http://www.agiweb.org/education/mpp.html>

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The ASLO Minorities Program: A Model for Scientific Societies Working to Increase Their Ethnic Diversity.

Benjamin E. Cuker (757-727-5884; benjamin.cuker@hamptonu.edu)
Hampton University, Marine Science, Hampton, VA 23668, United States

Shifting demographics of the population of the United States is resulting in an increasing proportion of ethnic minorities. Yet the representation of minority groups in the geosciences remains very low. The American Society of Limnology and Oceanography (ASLO) developed a successful program to address this issue. This NSF funded effort has run since 1990. Minority undergraduate and graduate students attend the annual ASLO meetings and a special pre-conference workshop. The highly structured program has many facets. These include field trips, keynote presentations from distinguished scientists, interactions with mentors and role-models, symposia for presentation of student research, workbooks to aid in navigating the meetings,