

skills; to enhance critical thinking; and to build teamwork. GPS geodesy is ideal for illustrating data literacy concepts. Data precision and accuracy depend upon several factors, including type of equipment, environmental conditions, length of occupations, monument design, site location, configuration of the geodetic network, and processing strategies. All of these can be varied, allowing the students to learn the trade-offs among cost, time, and quality and to determine the most efficient methodology for specific problems. In addition, precision, accuracy, and errors govern the interpretations that can be made and the potential to distinguish among competing models. Our focus is a semester-long course that uses GPS geodesy in real-world applications and also requires integration of GPS data into oral presentations and written reports. Students work in teams on cases that pose hypotheses for testing. The cases are derived from our on-going research projects and take advantage of on-line continuous GPS (CGPS) data as well as our archived campaign data. The case studies are: 1) Microplate tectonics in the northeastern Caribbean; 2) Inflation/deflation cycles of the Soufriere Hills volcano, Montserrat; and 3) Contribution of monument instability to the overall error in geodetic data from the New Madrid Seismic Zone. All course materials will be on-line and available for the community.

ED11A-0033 0830h POSTER

Solar Data in the Classroom: the TLRBSE Experience

Stephen M Pompea¹ (520.318.8285; spompea@noao.edu)

Constance E Walker¹ (520.318.8535; cwalker@noao.edu)

Steven K Croft¹ (520.318.8495; scroft@noao.edu)

Donald W McCarthy² (520.621.4079; dmccarthy@as.arizona.edu)

¹National Optical Astronomy Observatory, 950 N. Cherry Avenue, Tucson, AZ 85719, United States

²Steward Observatory, University of Arizona, Tucson, AZ 85721, United States

The Teacher Leaders in Research Based Astronomy program, based at the National Optical Astronomy Observatory in Tucson, has created an immersive research experience for middle and high school teachers at the National Solar Observatory at Sacramento Peak, New Mexico and provides support for teachers to use real solar data in the classroom. Teachers explored two months of daily multispectral images of the Sun during solar maximum using hard copy images and computer-based image processing tools and data CD-ROMs. These data sets included white light intensity, magnetograms, H-alpha, extreme ultraviolet, and x-ray images that students can explore as introductions to solar activity and to features such as sunspots, prominences, and faculae. The data can be used to trace the evolution of solar phenomena, track solar differential rotation, or to calculate daily sunspot numbers that can be compared with professional counts.

Teachers also constructed and aligned low cost solar telescopes that will be used to gather data on sunspots and other white light solar phenomena. This experience with solar data and images provides a direct lead-in to additional professional data sets available online at solar observatory sites. These data can be used to detail the development of energetic events such as coronal mass ejections and to follow solar phenomena over long time periods. Of greatest relevance to the teachers were the solar data that can be correlated with space weather data and regional terrestrial data on magnetic storms, satellite failures, and power outages.

URL: <http://www.noao.edu/education/noaoeo.html>

ED11A-0034 0830h POSTER

Interactive Geophysical Mapping on the Web

Chuck Meertens¹ (303-497-8011;

chuckm@unavco.ucar.edu); Michael Hamburger³ (812-855-2934; hamburg@indiana.edu); Lou Estey¹ (303-497-8036; lou@unavco.ucar.edu);

Marianne Weingroff² (303-497-2658;

marianne@ucar.edu); Ryan Deardorff² (303-497-2655; ryandear@ucar.edu); William

Holt⁴ (631-632-8215;

wholt@horizon.ess.sunysb.edu)

¹UNAVCO/UCAR, 3340 Mitchell Lane, Boulder, CO 80301

²UCAR/DLESE, P.O. Box 3000, Boulder, CO 80307

³Indiana University, Dept. of Geological Sciences, 1001 E. Tenth St., Bloomington, IN 47405

⁴SUNY at Stony Brook, Dept. of Geosciences, Earth and Space Sciences Bldg., Stony Brook, NY 11794

We have developed a set of interactive, web-based map utilities that make geophysical results accessible

to a large number and variety of users. These tools provide access to pre-determined map regions via a simple HTML/JavaScript interface or to user-selectable areas using a Java interface to a Generic Mapping Tools (GMT) engine. Users can access a variety of maps, satellite images, and geophysical data at a range of spatial scales for the earth and other planets of the solar system. Developed initially by UNAVCO for study of global-scale geodynamic processes, users can choose from a variety of base maps (satellite mosaics, global topography, geoid, sea-floor age, strain rate and seismic hazard maps, and others) and can then add a number of geographic and geophysical overlays for example coastlines, political boundaries, rivers and lakes, NEIC earthquake and volcano locations, stress axes, and observed and model plate motion and deformation velocity vectors representing a compilation of 2933 geodetic measurements from around the world. The software design is flexible allowing for construction of special editions for different target audiences. Custom maps been implemented for UNAVCO as the Jules Verne Voyager and Voyager Junior, for the International Lithosphere Projects Global Strain Rate Map, and for EarthScope Education and Outreach as EarthScope Voyager Jr.. For the later, a number of EarthScope-specific features have been added, including locations of proposed USArray (seismic), Plate Boundary Observatory (geodetic), and San Andreas Fault Observatory at Depth sites plus detailed maps and geographically referenced examples of EarthScope-related scientific investigations. In addition, we are developing a website that incorporates background materials and curricular activities that encourage users to explore Earth processes. A cluster of map processing computers and nearly a terabyte of disk storage has been assembled to power the generation of interactive maps and provide space for a very large collection of map data. A portal to these map tools can be found at: <http://jules.unavco.ucar.edu>.

ED11A-0035 0830h POSTER

Introducing Space Weather to the Standard Physics Curriculum

Lecia Barker¹ ((303) 735 5578;

barkerl@colorado.edu)

Isidoros Doxas² ((303) 492 7988;

doxas@colorado.edu)

¹Alliance for Technology, Learning and Society, UCB 40 University of Colorado, Boulder, CO 80309, United States

²Center for Integrated Plasma Studies, UCB 390 University of Colorado, Boulder, CO 80309, United States

A series of computer based modules is being developed that use the real-life effects of Space Weather to motivate the study of the basic concepts of Electricity and Magnetism at the level of a typical introductory physics course for non-majors. The modules are designed to enable instructors to engage students in exploring problems that are complex enough to be of practical interest, while still allowing them to concentrate on the simple concepts they need to learn. Extensive testing of students actual use of computer-based resources is being undertaken, to ensure that the modules will be effective in realistic classroom environments. The modules are based on similar units for Earth Science that have been developed and tested over the past five years, and evaluation results show both an improvement in student attitudes towards science, and content assimilation equal or better to that of textbook-based instruction.

ED11B MCC: Hall D Monday 0830h

Evaluating Geoscience Education

Projects II Posters (joint with OS, PA)

Presiding: K Garvin-Doxas, Center

for Integrated Plasma Studies; S

Henderson, University Corporation for Atmospheric Research

ED11B-0036 0830h POSTER

Are we Meeting our Goals in Geoscience Education Projects? The Critical Need for Program Evaluation

Sandra Henderson¹ (sandrah@ucar.edu)

Roberta M Johnson¹ (rmjohnsn@ucar.edu)

Susan Q Foster¹ (susanf@ucar.edu)

¹University Corporation for Atmospheric Research, Office of Education and Outreach PO Box 3000, Boulder, CO 80307, United States

In response to the need for collaboration between geoscientists and educators, many universities and research institutions have organized and implemented a multitude of education and outreach efforts. Programs have been developed to reach diverse audiences including K-12 science teachers and their students, undergraduate and graduate students, and the general public. While the breadth and scope of geoscience education and outreach activities are growing, program results and outcomes are not always clearly tracked or reported. It is important to determine if the goals and objectives of geoscience education projects are being met through a well designed evaluation approach. Traditionally, many education and outreach programs have asked for feedback in either a cursory fashion (short participant satisfaction feedback) or relied on anecdotal evidence. The University Corporation for Atmospheric Research's (UCAR) Office of Education and Outreach (EO) is building an extensive framework to gather evaluation and assessment information from all of its education programs that will inform program organizers and be of use to others interested in implementing similar programs. EO is the point of contact and dissemination for education and outreach at UCAR, the National Center for Atmospheric Research (NCAR), and the UCAR Office of Programs (UOP). EO collaborates with NCAR scientists through the creation of K-12 educational resources and technologies, web sites, professional development workshops, special events, public tours, and exhibits. To meet the diverse evaluation needs of those various education and outreach programs, qualitative and quantitative information gathering techniques are being used. This presentation will provide an overview of evaluation tools and techniques as well as the findings from two 2002 summer workshops, a mentor program, and a web site.

ED11B-0037 0830h POSTER

The DLESE Evaluation Toolkit Project

Susan M. Buhr¹ (303-492-5657;

susan.buhr@colorado.edu)

Lecia J. Barker² (barkerl@colorado.edu)

Mary Marilino³ (marlino@ucar.edu)

¹Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO 80309-0216, United States

²Alliance for Technology, Learning, and Society (ATLAS), University of Colorado, Boulder, CO 80309-0040, United States

³DLESE Program Center (DPC), University Corporation for Atmospheric Research, Boulder, CO 80309-3000, United States

The Evaluation Toolkit and Community project is a new Digital Library for Earth System Education (DLESE) collection designed to raise awareness of project evaluation within the geoscience education community, and to enable principal investigators, teachers, and evaluators to implement project evaluation more readily. This new resource is grounded in the needs of geoscience educators, and will provide a virtual home for a geoscience education evaluation community.

The goals of the project are to 1) provide a robust collection of evaluation resources useful for Earth systems educators, 2) establish a forum and community for evaluation dialogue within DLESE, and 3) disseminate the resources through the DLESE infrastructure and through professional society workshops and proceedings.

Collaboration and expertise in education, geoscience and evaluation are necessary if we are to conduct the best possible geoscience education. The Toolkit allows users to engage in evaluation at whichever level best suits their needs, get more evaluation professional development if desired, and access the expertise of other segments of the community.

To date, a test web site has been built and populated, initial community feedback from the DLESE and broader community is being garnered, and we have begun to heighten awareness of geoscience education evaluation within our community. The web site contains features that allow users to access professional development about evaluation, search and find evaluation resources, submit resources, find or offer evaluation services, sign up for upcoming workshops, take the user survey, and submit calendar items. The evaluation resource matrix currently contains resources that have met our initial review. The resources are currently organized by type; they will become searchable on multiple dimensions of project type, audience, objectives and evaluation resource type as efforts to develop a collection-specific search engine mature. The peer review criteria and process for ensuring that the site contains robust and useful resources has been drafted and received initial feedback from the project advisory board, which consists of members of every segment of the target audience. The review criteria are based upon DLESE peer review criteria, the MERLOT digital library peer review criteria, digital resource evaluation criteria, and evaluation best practices.

In geoscience education, as in most endeavors, improvements are made by asking questions and acting

upon information about successes and failures; project evaluation can be thought of as the systematic process of asking these questions and gathering the right information. The Evaluation Toolkit seeks to help principal investigators, teachers, and evaluators use the evaluation process to improve our projects and our field.

URL: <http://cires.colorado.edu/~k12>

ED11B-0038 0830h POSTER

Annual Snapshot Reports: Tracking the Extent and Nature of K-12 Earth and Space Science Education to Monitor, Evaluate, and Motivate the Revolution

Teon Edwards¹ (617-547-0430; Teon.Edwards@TERC.edu)

Daniel Barstow¹ (617-547-0430; Dan.Barstow@TERC.edu)

Michael J. Smith² (207-230-0046; msmith@agiweb.org)

¹TERC, 2067 Massachusetts Ave, Cambridge, MA 02140, United States

²American Geological Institute, 4220 King St, Alexandria, VA 22302, United States

Fueled by new technologies such as satellite perspectives and data visualizations, Earth and space science is transforming from a weak sister of physics, chemistry, and biology to a field that is revolutionizing our understanding of our planet and the universe. There are concerted efforts on federal, state, and local levels to extend this revolution to Earth and space science education in K-12 schools. To this end, the National Science Foundation sponsored the "National Conference on the Revolution in Earth and Space Science Education," with the goal of developing a vision for K-12 Earth and space science education reform for the next decade. The conference assembled a broad spectrum of stakeholders including K-12 teachers and administrators, scientists, university faculty, representatives of educational and scientific organizations, and policymakers. Participants developed a "Blueprint for Change," which recommended steps for large-scale implementation of Earth and space science education reform.

Since successful change is both driven and monitored by structured evaluation of progress, a vital recommendation of the Report is an ongoing national assessment (or "snapshots") of K-12 Earth and space science education. These proposed snapshots, released annually over a ten-year time frame, will provide all stakeholders with a status report on the nature and extent of Earth and space science education.

Most of the data for this project, which is in early planning stages, will be mined from existing reports and presented in a format that helps address specific questions of interest. When existing data are not available, some data gathering, such as surveys of state science supervisors and teacher-training institutions, will take place. Finally, since there will be important areas beyond the scope of the annual snapshots, the snapshots will help define a research agenda. For example, a key recommendation of the Revolution Report is an increased emphasis on "Earth as a system." Assessing classroom practice and student learning relating to Earth as a system requires innovative student assessment, observing classrooms, or other ambitious efforts. The Annual Snapshots will identify areas in need of further assessment, helping to define a research agenda for the Earth and space science education community.

URL: <http://www.EarthScienceEdRevolution.org>

ED11B-0039 0830h POSTER

The Use of Multiple Evaluation Methods to Guide Development of Educational Technologies in the Geosciences

Kathy Garvin-Doxas ((303) 492 4643; garvindo@colorado.edu)

Center for Integrated Plasma Studies, UCB 390 University of Colorado, Boulder, CO 80309, United States

NSF, NASA, and other funding agencies require program evaluations as part of any plan for improving education in the geosciences. In some cases, evaluation is an integral and vital part of program development, while in others, evaluation is treated as extraneous to the real work of developing educational resources. Triangulated evaluation methods (surveys, observations, interviews, document analysis) can be successfully used in a synergistic fashion to guide project development, but the task is often difficult given the different perspectives of those conducting the evaluation. A short overview of the methodology will be provided, and examples of how it was used in the development of the Solar System Collaboratory and other similar projects will be discussed.

ED11B-0040 0830h POSTER

The Development and Evaluation of the Climate Time Line Information Tool

Mark S. McCaffrey^{1,2} (303.497.6939; mark.mccaffrey@noaa.gov)

Dan Kowal² (303.497.6118; dan.kowal@noaa.gov)

C. Mark Eakin¹ (303.497.6172; mark.eakin@noaa.gov)

¹NOAA Paleoclimatology Program, 325 Broadway, Boulder, CO 80305, United States

²Cooperative Institute for Research in Environmental Sciences, 216 UCB, Boulder, CO 80309, United States

The Climate Time Line Information Tool or CTL (<http://www.ngdc.noaa.gov/paleo/ctl>) has been prototyped as a digital educational tool for conveying fundamental climatic processes and their human dimension for diverse audiences. Using a powers of ten approach to temporal scaling, the CTL website was developed through a CIRES Innovative Research Grant by Mark McCaffrey at the National Climatic Data Center's Paleoclimatology Program and Dan Kowal at the National Geophysical Data Center. CTL was specifically designed as an interdisciplinary tool for conveying information about weather and climatic processes, such as the diurnal, annual and orbital cycles and ENSO. Moreover, the web site explores potential connections between climatic variability and human development over the past 100,000 years. Evaluation of the prototype examined issues of usability and navigation of the site as well as how its content and framework served the needs of undergraduate, middle and high school students, geoscience educators, and climate experts. The development and evaluation of the Climate Time Line provide a case study for other geoscience researchers and educators on: i) how objectives were set by developers; ii) how evaluators were involved in assessing the prototype; iii) the variety of evaluative methods available to test the viability of the product; and iv) how results from the evaluation can be used to finalize the prototype.

URL: <http://www.ngdc.noaa.gov/paleo/ctl/>

ED11B-0041 0830h POSTER

Evaluating the Use of Visualization Resources for Teaching Inquiry to Pre-service Elementary Teachers

Michael R. Taber¹ (970-351-2470; mrtaber@unco.edu)

Kristin Quadracci¹ (970-351-2470; quad3790@blue.unco.edu)

Manisha Javeri (970-351-2470; manisha-javeri@hotmail.com)

¹University of Northern Colorado, Department of Earth Sciences, Box 100, Greeley, CO 80631, United States

We have developed a pilot method for assessing student outcomes as they are related to the teaching of inquiry. The pilot assessment model focuses on improving elementary teacher preparation in geosciences at the University of Northern Colorado. The model consists of a structure for implementing visualization learning environments in an undergraduate upper division course for non-majors (simulations, modeling, and imagery of real data sets) and a method for assessing student outcomes. We will present the framework, data, and analysis from a two-semester study. Data indicates students are able to scaffold their inquiry skills in interpreting the relationship among three or more variables in a complex system. For example, students are able to use visualizations to observe, analyze, and predict volcanic type, earthquake depth, and earthquake magnitude relationships based on the type of plate boundary. Students then refine, apply, and defend their knowledge to a new world; complete with plate boundaries they've created. The entire learning environment is managed using WorldWatcher, a complete data analysis and visualization software.

URL: <http://esci.unco.edu/faculty/taber/modest/index.htm>

ED11B-0042 0830h POSTER

Technology-Supported Performance Assessments for Middle School Geoscience

Daniel R. Zalles¹ (650-859-5248; daniel.zalles@sri.com)

Edys Quellmalz¹

Anders Rosenquist¹

Patricia Kreikemeier¹

¹SRI International, 333 Ravenswood Avenue, Menlo Park, CA 94025, United States

Under funding from the World Bank, the U.S. Department of Education, the National Science Foundation, and the Federal Government's Global Learning and Observations to Benefit the Environment Program (GLOBE), SRI International has developed and piloted web-accessible performance assessments that measure K-12 students' abilities to use learning technologies to reason with scientific information and communicate evidence-based conclusions to scientific problems. This presentation will describe the assessments that pertain to geoscience at the middle school level. They are the GLOBE Assessments and EPA Phoenix, an instantiation of SRI's model of assessment design known as Integrative Performance Assessments in Technology (IPAT). All are publicly-available on the web.

GLOBE engages students in scientific data collection and observation about the environment. SRI's classroom assessments for GLOBE provide sample student assessment tools and frameworks that allow teachers and students to assess how well students can use the data in scientific inquiry projects. Teachers can use classroom assessment tools on the site to develop integrated investigations for assessing GLOBE within their particular science curricula. Rubrics are provided for measuring students' GLOBE-related skills, and alignments are made to state, national, and international science standards. Sample investigations are provided about atmosphere, hydrology, landcover, soils, earth systems, and visualizations.

The IPAT assessments present students with engaging problems rooted in science or social science content, plus sets of tasks and questions that require them to gather relevant information on the web, use reasoning strategies to analyze and interpret the information, use spreadsheets, word processors, and other productivity tools, and communicate evidence-based findings and recommendations. In the process of gathering information and drawing conclusions, students are assessed on how well they can operate the technology as well as reason with the information made available through its use. In EPA Phoenix, students are asked to examine different representations of air quality data on the EPA website, as well as national weather data, in order to judge whether Phoenix would be a good site for holding certain athletic events. The students are assessed on how well they can interpret the data, synthesize it, and develop and communicate their conclusions. With the exception of formulating Web searches, results from piloting indicated that students were better at operating technology and interpreting single data sources than they were with synthesizing data from multiple sources and communicating cohesive evidence-based conclusions.

Under the aegis of NSF and the International Association for the Evaluation of Educational Achievement, SRI is developing more IPAT assessments in science for a comparative international research study about student achievement in information and communication technology. These assessments will add other technologies into the mix such as dynamic modeling tools and geographic information systems.

URL: <http://ipat.sri.com>

ED11B-0043 0830h POSTER

An Assessment of Student Learning in an Online Oceanography Course: Five Years After Implementation

Donald L Reed (408-924-5036; dreed@geosun.sjsu.edu)

Dept. of Geology, San Jose State University, San Jose, CA 95192-0102, United States

The results of assessing student learning in an online oceanography class offered over the past five years are compiled to reveal several general trends. In order to understand the context of these trends, it is important to first note that SJSU has a two-tiered general education program consisting of a category of core courses for frosh and sophomores and an advanced category for juniors and seniors, most of whom are community college transfers. The course described in this study is in the latter category and therefore composed largely of seniors. Enrollments in the course have exploded from 6 students in a pilot section offered during the 1998 fall semester to over 170 students in the summer semester of 2002. The course is now offered in both semesters of the academic year with four sections offered during 2002 summer session as part of a system-wide conversion to year-round operation. No other course, be it classroom, hybrid or online, in the general education category has experienced the level of student demand as this online course. All sections of the online course reach enrollment limits in the first days of registration with an equal or greater number of students turned away each semester.

More female, students of color, returning students and K-12 in-service teachers enroll in the online sections than in the equivalent classroom sections of the course. Students enroll in the online section for the convenience of self-paced learning since attending a classroom section is not a viable option. Enrollments in concurrent classroom sections have not been negatively impacted by the addition of online sections. Enrollment attrition is higher in the first few days of the online course, but similar to that experienced in the

classroom sections, once the class is underway. However, student requests for incompletes tend to be somewhat higher in the online course, especially during the summer offerings.

Learning outcomes are reviewed at the beginning of the course and subsequent assessment on achieving each outcome is embedded in the graded assignments, which include a critical thinking essay on declining marine fisheries, one mid-term exam that emphasizes the application of basic math and the methods of scientific discovery in the context of ocean research; poster presentations in a symposium-style format, a course portfolio of web-based work, weekly discussions on an electronic bulletin board and a take-home final consisting of an original research grant proposal. The diverse nature of the graded assignments assures a comprehensive assessment of student learning from a number of perspectives, such as quantitative, qualitative, and analytical. Student learning compares favorably with classroom sections of the course, even though some students lack the discipline for self-paced learning. The distribution of the course grades in the online section typically differs from classroom sections by having higher percentages of both high and low performing students and fewer students clustered about the mean. Students strongly affirm that communication with the instructor in the online course is far greater, and of higher quality, than in classroom sections.

ED11B-0044 0830h POSTER

Evaluating Improvements to the Student Learning Experience in an Honours Earth and Environmental Sciences Program

Carolyn H. Eyles¹ (905-525-9140-23524; eylesc@mcmaster.ca)

Susan Vajoczki¹ (905-525-9140-23520; vajoczki@mcmaster.ca)

Gosia Zobel¹ (905-525-9140-23520)

¹School of Geography and Geology, McMaster University, 1280 Main St. W., Hamilton, Ont L8S 4K1

The School of Geography and Geology (SGG) at McMaster University recently received funding for a three-year project to apply new teaching strategies to enhance the undergraduate learning experience. A major focus of this project is to develop multiple opportunities for inquiry-based and experiential learning in the four-year Honours B.Sc program in Earth and Environmental Sciences. A second aim of the project is to enhance systematic personal transferable skills development in all students enrolled in this program.

The aims of the SGG educational project are being met through progressive revision and refinement of instructional methodologies and the introduction of increased opportunities for experimental lab work, fieldwork, co-op and volunteer placements. Introductory level laboratory assignments are now up to 70% inquiry-based and fieldwork opportunities exist for all students within the program. A major hurdle to assessing the success of the project is evaluation of the effectiveness of the educational changes made in the programs. To date, a number of evaluation tools have been used to assess improvements to the learning experience including formative and summative student feedback (both informal and formal), student performance evaluations (pre- and post-course), and surveys of program alumni and potential employers. A system for the evaluation of personal transferable skills development is currently being developed using a skills attainment grid. By comparing future student attainment and feedback with that documented in a baseline survey carried out at the beginning of the project, it is hoped that assessment of improvements to the student learning experience can be made.

ED11B-0045 0830h POSTER

Designing and Evaluating a Climate Change Course for Upper-Division Engineers and Scientists

Perry J Samson (734-763-6213; samson@umich.edu)

University of Michigan, Dept. Atmospheric, Oceanic Space Science, Ann Arbor, MI 48109-2143, United States

AOSS 300, GLOBAL ENVIRONMENTAL IMPACT OF TECHNOLOGICAL CHANGE, was created to provide a mechanism for scientific exploration of the unexpected global environmental side effects of technological innovation with emphasis on issues of the atmosphere and oceans. The course is specifically designed to contribute to the desired Accreditation Board for Engineering and Technology (ABET) outcomes that engineering and science graduates possess "the broad education necessary to understand the impact of solutions in a global and societal context."

To facilitate this new course a new suite of coupled Flash/PHP/MySQL tools have been created that allow personalization of the students' learning space and interaction with faculty. Using these tools students are challenged to actively participate in the construction

of knowledge through development of on-line portfolios that influence course content. This paper reports on lessons learned in the first semester that will guide further course development.

URL: <http://www.engin.umich.edu/class/aoss300/>

ED11B-0046 0830h POSTER

RESEARCH INTO STUDENTS PRE-INSTRUCTIONAL BELIEFS OF ASTROBIOLOGY RELATED SCIENCE CONCEPTS

Erika Offerdahl¹ (520-626-9480; eofferdahl@as.arizona.edu)

Edward Prather (eprather@as.arizona.edu)

Timothy Slater (tslater@as.arizona.edu)

¹University of Arizona - Department of Astronomy, 933 N Cherry Ave, Tucson, AZ 85721, United States

The purpose of this study was to identify and document student beliefs and reasoning difficulties concerning astrobiology related topics. This was accomplished by surveying over two thousand middle school, high school, and college (science and non-science majors) students. Students were surveyed utilizing student-supplied response questions focused on the definition of life and its limitations, evolution of Earth (biologically and geologically), and the role of water for life as we know it. Careful, inductive analysis of student responses revealed that the majority of students correctly identify that liquid water is necessary for life and that life forms can exist without sunlight. However, many students incorrectly state that life cannot survive without oxygen. Furthermore, when students are asked to reason about life in extreme environments, they most often cite complex organisms (such as plants, animals and humans) rather than the more ubiquitous microorganisms. Students also have well-established models of the relationship between the geologic and biologic evolution of Earth. Results of this study were used to guide the development of a set of inquiry-based activities, which will be highlighted.

ED11B-0047 0830h POSTER

The Geoscience Concept Test: A New Assessment Tool Based on Student Misconceptions

Julie Libarkin¹ (jlibarki@cfa.harvard.edu)

Steven W Anderson² (steveanderson@bhsu.edu)

William J Boone³ (wboone@indiana.edu)

Meredith Beilfuss³ (mbeilfuss@indiana.edu)

Julie Dahl² (juliedahl@k12.sd.us)

¹Science Education Department, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA 02138

²Science Department, Black Hills State University, Spearfish, SD 57799-9102

³College of Education, Indiana University, Bloomington, IN 47405-1006

We developed and began pilot testing of an earth science assessment tool called the geoscience concept test (GCT). The GCT uses student misconceptions as distractors in a 30 item multiple-choice instrument. Student misconceptions were first assessed through the analysis of nearly 300 questionnaires administered in introductory geology courses at three institutions. Results from the questionnaires guided the development of an interview protocol that was used by four interviewers at four different institutions. Over 100 in-depth student interviews lasting from 0.5 to 1 hour probed topics related to the Earth's interior, geologic time, and the formation of Earth surface features such as mountains and volcanoes to better define misconceptions. Thematic content analysis of the interviews identified a number of widely held misconceptions, which were then incorporated into the GCT as multiple-choice distractors (wrong answers). For content validity, the initial GCT was reviewed by seven experts (3 geoscientists and 4 science educators) and revised before pilot testing.

Approximately 100 introductory and non-science major college students from four institutions were assessed with the GCT pilot in the spring of 2002. Rasch model analysis of this data showed that students found the pilot test difficult, and the level of difficulty was consistent between the four institutions. Analysis of individual items showed that students had fewer misconceptions regarding the locations of earthquakes, and many misconceptions regarding the locations of volcanoes on the Earth's surface, suggesting a disconnect in their understanding of the role of plate tectonics in these phenomena. Analysis of the misfit statistic for each item showed that none of the questions misfit, although we dropped one question and modified the wording of another for clarity in the next round of piloting. A second round of piloting scheduled for the fall

of 2002 includes nearly 3000 students from 34 institutions in 19 states.

ED11C MCC: 270 Monday 0830h

Evaluating Geoscience Education Projects I (joint with OS, PA)

Presiding: S Buhr, University of Colorado; L Barker, Alliance for Learning Technology and Society

ED11C-01 0830h INVITED

Using Project Evaluation to Focus and Improve Earth and Space Science Education and Public Outreach Projects

Timothy F Slater (5206217096; tslater@as.arizona.edu)

University of Arizona Steward Observatory, 933 N Cherry, Tucson, AZ 85721, United States

It is becoming common for research geoscientists to become involved with, and often lead, earth and space science education projects for K-18 levels and outreach to the general public. Typically, these projects have three principle goals: (i) increase the general geosciences background knowledge of participants; (ii) enhance the participants' life-long attitudes toward geosciences, and science in general; and (iii) increase participants' skills toward using geoscience principles (high quality teaching by teachers, advanced fieldwork by amateurs, science-positive voting by legislators, etc.). As many financially sponsoring foundations or agencies now require a project evaluation, research scientists are being asked to document the effectiveness and impact of their activities. Evaluation plans are often presented in proposals as a matrix with rows indicating the specific project goals and outcomes with columns showing project activities, assessment data sources and analysis strategies, and performance indicators of success. Geoscience knowledge increases are commonly measured by pre- and posttests, enhanced attitudes with pre- and posttest Likert scale surveys with responses ranging from "(1) strongly agree" to "(5) strongly disagree," and improved skills by clinical interviews or observation checklists. Quantitative data can be validated qualitatively using individual or group interviews with participants; however, the evaluation results that are often the most convincing employ a triangulated, multi-data source approach to assessing stated project goals which use a combination both quantitative and qualitative data. This work supported in part by NSF TE 9731083 and NASA #NAG5-4576.

URL: <http://shiraz.as.arizona.edu>

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OERL: A Tool For Geoscience Education Evaluators

Daniel R. Zalles (650-859-5248; daniel.zalles@sri.com)

SRI International, 333 Ravenswood Avenue, Menlo Park, CA 94025, United States

The Online Evaluation Resource Library (OERL) is a Web-based set of resources for improving the evaluation of projects funded by the Directorate for Education and Human Resources (EHR) of the National Science Foundation (NSF). OERL provides prospective project developers and evaluators with material that they can use to design, conduct, document, and review evaluations. OERL helps evaluators tackle the challenges of seeing if a project is meeting its implementation and outcome-related goals.

Within OERL is a collection of exemplary plans, instruments, and reports from evaluations of EHR-funded projects in the geosciences and in other areas of science and mathematics. In addition, OERL contains criteria about good evaluation practices, professional development modules about evaluation design and questionnaire development, a dictionary of key evaluation terms, and links to evaluation standards. Scenarios illustrate how the resources can be used or adapted. Currently housed in OERL are 137 instruments, and full or excerpted versions of 38 plans and 60 reports. 143 science and math projects have contributed to the collection so far. OERL's search tool permits the launching of precise searches based on key attributes of resources such as their subject area and the name of the sponsoring university or research institute.

OERL's goals are to 1) meet the needs for continuous professional development of evaluators and principal investigators, 2) complement traditional vehicles of learning about evaluation, 3) utilize the affordances of current technologies (e.g., Web-based digital libraries,