

HOW DOES USGS IMPLEMENT A MEANINGFUL INTEGRATION OF ITS RESEARCH & EDUCATION CONTRIBUTIONS DURING A RESTRICTIVE AND COMPETITIVE BUDGET CLIMATE?

“It is of great importance that the general public be given the opportunity to experience, consciously and intelligently, the efforts and results of scientific research. It is not sufficient that each result be taken up, elaborated, and applied by a few specialists in the field. Restricting the body of knowledge to a small group deadens the philosophical spirit of a people and leads to spiritual poverty.”

- Albert Einstein

The Premise:

While education may conjure up a host of operational meanings arising from one's own values and experiences, at the heart of the educational process lies the acquisition and integration of specialized knowledge. Working from the Survey's mandated role of providing long-term monitoring, research and assessments, the Survey's Strategic Plan reflects the high priority given to meeting partner and customer needs in disseminating reliable and impartial scientific information. In a conformable, synergistic way both research and education have, as their ultimate goal, enhanced scientific literacy of the citizenry. Education and research are always in the public service and therefore both are inextricably bound at all levels. When present, effective integration of research and education infuses the acquisition of knowledge with the spirit of inquiry and assures that the findings and methods of research are quickly and effectively communicated in a broader context and to a larger audience. To the extent that the public understands the significance of an agency's work, that agency will be supported.

Background:

USGS has a long history of involvement in education and outreach activities. Product lines include teaching packets, booklets, maps, posters, information on related source material, fact sheets and, more recently, CD-ROM and Web based multimedia materials. Internships, short courses, recruitment presentations, assistance to public broadcast programming on USGS research, summer camp programs, and direct support of professional societal efforts such as Earth Science Week represent a further range of educational involvement. Yet much of what has been accomplished has been achieved in something of an ad hoc manner, frequently independent of expectations and, at times, even independent of the most basic levels of support and recognition. Almost all of program and product achievements have been, as one long-time employee said, “hidden under a basket.”

Over the past two years, both an internal and external committee conducted a review of the education role of USGS. The Education Working Groups' charge, given by the Director, was to address the question, “What should the role of USGS in education be?” Each committee met independently reviewing the current status of USGS education. A combined committee report was developed incorporating both committees'

recommendations. Background material and briefing documents with recommendations were presented and approved by the USGS Executive Leadership Team in January 2001. A Director's Decision Document went forth on 10/10/01. Major outcomes of the study were that the USGS will:

- Contribute to the improvement of science education in the Nation.
- Bring science to a diversity of students.
- Educate the public on the role of natural science in society's well being and its importance to decision-making.
- Create a broader awareness of the USGS mission.

USGS Education is now at the stage of identifying specific actions that will bring forth its programmatic vision and aspirations

Vision:

USGS is a world leader in its ability to integrate its educational activities with its ongoing research programs.

Mission:

- Provide reliable and useful scientific information to the formal and informal educational communities.
- Contribute to the large pre-college base of instruction as well as the interagency efforts addressing P.L. 107-110 No Child Left Behind Act.
- Develop the *Learning Web* as a principal portal for educational information.
- Engage the competencies and talents of the bureau's research scientists to enhance national literacy in the natural sciences.
- Attract and maintain a diversified, quality workforce with the skills that enhance our programs and serve our customers.
- Demonstrate USGS's critical national placement, purpose and importance in meeting and resolving complex issues.

The way in which USGS research translates knowledge and makes it available to scientific organizations and to the public is critical to the intrinsic societal value of USGS. The finest programs, both within government, academia and the corporate sector have developed a projectable identity that allows for ready identification. This identification is especially important in public settings as it works both within the organization and without clarifying what it is about, the importance of the group's activities, and what they are striving to accomplish. In turn, identity is dependent upon the ability to provide useful knowledge within a relevant context. It is the goal of the USGS education program to provide the critical linkage to science information in a way that makes knowledge adaptable for a variety of customers in the broadly based educational community.

Who Are Our Customers and Partners:

Strategic Goal Linkage:

Customer Strategic Goal – To optimize service to our customers (users of our information) and broaden the customer base with timely, innovative products and effective interaction as presented in our mission.

The pre-college (K-12) community, with its 70 million students and over 3 million teachers, is a substantial user of USGS products. Moreover, this community has considerable “value added” benefits as knowledge acquired in this sector permeates through to families and communal organizations. Attention to this sector is also vital to the strategic goal of attracting and maintaining a diversified and qualified workforce with the skills that enhance our programs and services. Furthermore, USGS’s effort in pre-college education is also necessary in order to meet our responsibilities to the interagency initiative that addresses the goals put forth in the 2001 P.L. 107-110 No Child Left Behind Act.

It is also important to recognize that a wide range of educational opportunities, outside of the pre-college sector, is available to researchers. For instance, contributions to exhibits and instructional outreach efforts of museums, or to public and corporate broadcast programs, have enormous potential for reaching wide audiences. Assistance to the educational efforts of our professional societies further strengthens scientific linkages and helps raise public awareness of the importance of our work. Contributions to undergraduate and graduate program development, particularly in terms of providing needed guidance on up-to-date technical procedures, subject content or employment opportunities provide useful instructional relevance and potential collegial research synergy. Work with other Bureaus in the Department in their efforts to implement education programs and activities are also important as it is clear, that, in the future, finding effective ways to foster working relationships between the institutions of society, for the purposes of both education and research, will be imperative.

Critical Program Elements:

The Learning Web

Strategic Goal Linkage:

Customer Strategic Goal – To provide the public with easily accessible earth science information

Today we can link people anytime or anywhere with resources on a scale that was unimaginable only a few years ago. Yet, we have only begun to understand how people use and learn from Web-based educational resources - a media whose potential for growth appears almost limitless. Our agency is fortunate to have a wealth of exciting and newsworthy scientific content suitable for translation and dissemination to students and the public through the Internet. Because of continuing costs associated with providing

print and multimedia material, more and more educational information and products are being acquired electronically. Redesigned and reorganized in 2001, *The Learning Web* is the principal USGS portal for educators and students. USGS real-time information, current research investigations, many past publications, as well as a range of instructional activities are available on this site. *The Learning Web* is clearly a recognized strength of the Survey's educational outreach program. General feedback and targeted assessments about the site's content and design from customers and focus groups have been most favorable. It has even received a National Education Association Award over the past year. As with all effective and ongoing web sites, continued development and improvement is required. *The Learning Web* must evolve to become more interactive, where USGS information can be accessed and analyzed to help answer real-world questions and issues. What realistically will be required to bring *The Learning Web* to this desired level?

Linkage With Discipline Objectives

USGS recognizes that knowledge is the basis of sound public policy and that research drives progress in both economic growth and social reform. USGS research, in the way that it translates information and makes it available to scientific organizations and the public, is critical to its intrinsic societal value. The Survey's Strategic Plan reflects the high priority of meeting customers' needs for reliable and impartial information. This commitment is the cornerstone upon which USGS education seeks to build its contributing program. There is much to suggest that USGS is well positioned for making this contribution. For example, three of the Geologic Discipline's six objectives have a strong educational base. "Greatly enhance the public's ability to locate, access, and use Geologic Discipline's maps and data," "Effectively transfer the knowledge acquired through the Geologic Discipline's science activities," and "Promote interdisciplinary research" are all statements inherently linked with the broader educational impact of their work (from: *Geology for a Changing World, A Science Strategy for the Geologic Division of the U.S. Geological Survey, 2000-2010*). The Water Resource Discipline and Biological Resource Discipline also prominently place "increasing awareness and understanding through outreach and education," and "partnering and delivery of products, programs and services" in their respective stated goals and objectives. What are the specific action implications of these statements and how might they best be facilitated?

Long-term People Goals:

Reinforce strategic direction through reward system.

Need to Reward Individuals:

With a broader view of the functions and purposes of education, it is important that the peer evaluation process recognizes and rewards scientists who dedicate a portion of their time to education activities. Most research scientists have an interest in disseminating the knowledge and significant understandings that they have acquired on critical and fundamental issues. It should be understood that professional accomplishments in education are a sanctioned part of the annual merit review and promotion process for scientists. Disciplines do recognize research-oriented, non-publication contributions. For

example, the Geologic Discipline Research Peer Evaluation Guidelines specifically states, “A common misperception is that a non-publication contribution means a non-research contribution. The RGEG (Research Grade Evaluation Guide), the panel process, and the scientific health and stature of the science are poorly served by such an equation.” The guidelines go on to state that Section 12, Factor IV, is intended to “highlight” legitimate, research-related contributions, specifically “efforts toward education or communication of science to the public, i.e. scientific outreach; and information and technology transfer.” (By way of further note, USGS education, as envisioned, will, in many instances, lead to publishable products.)

Functionally, however, the present RGEG has not been effective at recognizing valuable educational contributions. Presently, OPM is in the process of revising the RGEG. Will this revision give better recognition for educational contributions and what might be the best way to provide effective input?

Form and Function

Operations Strategic Goal:

Continuously improve our infrastructure and operational processes and practices to efficiently and effectively support our people, programs, and customers.

With almost 400 offices across the Nation involving more than 2000 partners, the USGS offers an abundance of information at both regional and national scales. Yet, as noted by the Education Working Group, USGS education is, at present, more of a dispersed, ad hoc system rather than a planned coordinated effort. There is nothing inherently wrong with being dispersed, but to be unplanned is to, unavoidably, marginalize the effort and minimize its collective effect. Most research scientists agree, at least in principle, that educational and outreach contributions are vital. Yet, in practice, what most often get squeezed out are those broadly synthesizing “service” activities. This marginalization is not done purposely, but rather is a result of competing demands of time and not having a clear idea of how best to proceed. A structure that efficiently directs researchers’ energies toward some appropriate level of educational concern and performance (where findings are quickly and effectively communicated in a broader context and to a larger audience) rather than in overcoming built-in, administrative or performance hurdles is critical. What are some ways in which this might be accomplished within the existing USGS culture and operational procedures?

Expectations: The purpose of this exercise is to develop strategies that will provide a well-positioned opportunity for meaningful integration of education and research. A certain synergism occurs when such interest is present - one that is good both for science and education.

Several key elements of USGS education have been identified and I would ask the group or groups that consider them to develop a list of guiding principles that will help the

leadership of throughout USGS recognize the central importance of these elements and further assist them in advancing our educational contributions. Are there examples from your point of view where we have successfully had the correct balance between these two activities? What made these activities successful? What are possible pitfalls to avoid, and possible approaches to consider? In some cases, your principles could lead to policy statements and in other cases simply increasing awareness might be enough.