2008 American Geological Institute Geoscience Leadership Forum
"Public-Private Partnerships in the Geosciences"
September 8, 2008

Forum Summary

1. Welcome, Introductions, Challenges and Objectives: Fred Spilhaus, Executive Director, American Geophysical Union; Pat Leahy, Executive Director, American Geological Institute; Peter McCabe, President, American Geological Institute

A gap exists in the geoscience community among academe, industry, and federal and state government. This gap reduces the credibility of geoscientists and hinders their ability to advance geosciences and communicate with the public and with policy makers. Bridging this gap is critical to solving workforce issues, engaging in better research opportunities, achieving a better understanding of earth processes, and being able to better serve the public. This is especially significant as geoscience becomes increasingly important in today's society and inherently of broad interest, particularly natural resources and environmental issues.

The specific objectives of this forum are to identify how the public and private sectors can work together to more effectively communicate their shared needs to decision-makers; to advance research, education and technology goals; and to attract and train a cutting edge workforce for the challenges of the 21st century. We aim to develop guidelines and resources that can be used by geoscientists to build bridges between the public and private sector in the areas of communications, research, and education and workforce.

2. How can the public and private sectors collaborate more effectively to advance research, education and technology goals?

Judy Totman Parrish, Professor, University of Idaho

Judy focused on issues specific to academia. She pointed out that the tenure cycle is out of sync with the current rapid pace of technological advances. She posed several questions to the audience: What is the appropriate level of collaboration with industry? How can objectivity be maintained in industry-supported research? Why do students go to university and is this different than previously? Should universities provide education or training? Judy advocated the need to engage in a national discussion of what the public wants from universities and how the role of universities has changed in this age of rapidly accessible information.

Colin North, Senior Lecturer, University of Aberdeen

Colin's talk was entitled: "Perception, expectation, transparency, and reputation: a view from across the pond." He provided an overview of the major differences between US and UK university systems. He used the University of Aberdeen as an example where a bachelor's degree provides a broad education whereas a one-year master's program

provides very focused training aimed at preparing students for entering the industry workforce. Colin stressed that the best way to increase support of university programs by industry was to build personal contacts through networking.

Russ Slayback, Senior Consultant, Leggette, Brashears and Graham Inc.

Russ shared his perspective on the relationship between academia and industry as the owner of a company that employs many geoscientists with bachelor's and master's degrees but very few PhDs. His company hires students with broad education backgrounds in the geosciences and he would not advocate universities to provide specific industry training in his field of hydrogeology at least. Russ did identify several things universities could do to better prepare students to work in industry. Among them are that most academic geologic training is focused on surficial processes but there should be more training in subsurface techniques, students should get some exposure to industry work environments during college, and that universities should support students with all career goals as opposed to catering to those who are potential PhD candidates.

Rich Lane, Program Director, National Science Foundation

Rich delivered a presentation entitled, "Public-private partnerships in the geosciences: industry and the NSF-GEO." He gave several examples of funding available which encourages academe-industry cooperation and of current projects in which academe and industry work together. Some of the difficulties for the NSF include that NSF lacks a policy statement on public-private sector interactions, that the government undergoes constant reorganization, and that NSF and industry involvement are perceived to be mutually exclusive. Rich encouraged societies to act as a link among academe, industry, and government by being less polar organizations and by promoting joint sponsorship of workshops and technical sessions.

Panel Discussion

Moderator: Pat Leahy
Panelists: Judy Totman Parrish, Colin North, Russ Slayback, and Rich Lane

Each panelist was asked to reiterate the most important message from their presentation. Judy identified the need for a national discussion about what the public wants from universities. Colin highlighted the importance of discussion between academe and industry, and the importance of incorporating industry in lobbying efforts. Rich Lane emphasized that societies should work to ensure a broader and more focused bachelor's degree even if it is at the detriment of the liberal arts education.

Other comments that were made include the following. There is a lack of provision for overhead in NSF funding. Judy pointed out that part of the deficit in geoscience majors may be linked to the negative image associated with the oil and metals industries.

3.0 How can the public and private sectors work together more effectively to communicate their shared needs to decision-makers?

Scott Tinker, State Geologist of Texas and Director of the Bureau of Economic Geology, University of Texas at Austin

Scott focused his presentation on how people from an academic background can most effectively communicate with their congressional representatives. His key points included making sure to identify the benefit for a congressperson to champion an issue and to make a clear and succinct request for a specific action. He pointed out that one has to be willing to work within the system to be able to accomplish anything.

Stu Nishenko, Senior Seismologist, Pacific Gas and Electric Co.

Stu's began his presentation with examples of successful public-private partnerships. In particular, he highlighted the power of engaging members of congress in events, using visuals to convey a clear message, and seizing the opportunity to act when the political climate is right.

Peter Scholle, State Geologist of New Mexico and Director of the Bureau of Mines and Mineral Resources, New Mexico Tech

Peter's talk was entitled "Collaboration in Mapping and Mineral Resource Programs." He described the National Cooperative Geologic Mapping Program (NCGMP) as an excellent example of how a structured business model can facilitate federal-state-public sector collaboration. Peter stressed that government and industry work best together when education or "research without attached strings" are the main components of the collaboration. Peter has found the most effective tool for communicating with decision-makers to be field conferences that provide hands-on experience with geoscience issues.

Steve Wells, President, Desert Research Institute of the Nevada System of Higher Education

Steve presented several examples of collaborative, water resources-related projects. One key idea of Steve's presentation was the importance of time and patience to the success of carrying out a collaborative project. He stressed the importance of talking personally with stakeholders to build a trusting relationship and an understanding and acceptance of objective science.

Panel Discussion

Moderator: Peter McCabe

Panelists: Scott Tinker, Stu Nishenko, Peter Scholle, Steve Wells

A lot of interest was expressed in the program Peter Scholle presented about taking decision-makers on field trips to give them a tangible connection to geoscience issues. Peter explained the logistics in more detail. Jessica Ali-Adeeb suggested that the geoscience community should take advantage of the name recognition that the USGS has by using them as a public face for communicating with non-science audiences. Pat Leahy and several others contributed to a discussion about the challenge of finding (or training) someone who speaks to non-science audiences to champion an issue. Steve Wells proposed that universities offer master's programs in which multiple candidates solve a problem together. This would develop the teamwork skills that are so important in industry. Judy Parrish reiterated that the way universities are currently structured prevents many faculty members from getting involved in efforts to increase communication with and education of non-science audiences.

4.0 How can the public and private sectors collaborate more effectively to attract and train a cutting edge workforce for the challenges of the 21st century?

Chris Keane, Director of Technology and Communications, American Geological Institute

Chris gave a presentation entitled "Public-private collaboration in building geoscience workforce: issues and a reality check." He summarized the state of the geoscience workforce and identified major challenges to developing a more robust workforce. Chris urged the geoscience community to move away from dwelling on challenges faced in the past and to join forces with other STEM fields in fighting today's common challenges for moving forward.

Bill Valdez, Director, Office of Workforce Development for Teachers and Scientists,

Bill reported on the state of the workforce in the United States: 7-8% of the population are scientists but as many at 30% are involved in STEM-related work. Foreign talent lends elasticity to the workforce market but this has been dramatically reduced since September 11, 2001. Therefore, "growing our own" workforce of scientists has become increasingly critical. The federal response has been limited and chaotic because the few STEM related federal agencies lack the funds, resources, and clout to have a workforce development office.

Peter Carragher, Senior Geoscience Advisor, BP

Peter began his presentation with the statement that hydrocarbons and coal will continue to be the main fuel source in the United States throughout the rest of the 21st century. He summarized the timeline for development and production of new oil fields and reported projections for future discoveries. He underlined the importance of maintaining a workforce of well-educated, adaptable geology graduates with field experience.

Mike Loudin, Global Recruiting Manager, ExxonMobil

Mike gave a presentation entitled "Identifying and Hiring Our Future Geoscience Workforce." With large scale turnover imminent, ExxonMobil is working to recruit a diverse new workforce. Mike identified networking, communication, and leadership skills as well as a strong background in math and science as key characteristics of potential employees. He shared a couple of examples of ExxonMobil programs aimed at bolstering a diverse geoscience workforce. GeoFORCE is a program in Austin, Texas which supports minority students throughout their high school years and encourages them to explore higher education opportunities in the geosciences.

Panel Discussion

Moderator: Linda Rowan
Panelists: Chris Keane, Bill Valdez, Arthur Donovan, Mike Loudin

Scott Tinker asked if everyone agreed with Peter Carragher's statement that the majority of the United State's energy during the next century will continue to be from fossil fuels. Peter responded by saying that hydrocarbons and coal will be an important bridge while we conduct new research. He advocated investment in "breakthrough technologies." Judy Parrish pointed out that even though lots of resources have been put into advancing STEM in K-12 education, there has not been an increase in students studying those disciplines in college. Mike Loudin agreed that ExxonMobil has not had much success with K-12 programs in the past but he is hopeful that GeoFORCE's comprehensive approach will have real positive results. They are closely following participants through college with metrics designed to measure the impact of program. It is too early to conclude whether GeoFORCE will be successful.

5.0 Discussion and Action Items

Participants split into four groups to identify the most important actions that can be taken by industry, academia, government organizations, and geoscience societies to bridge the gap that exists among them. These ideas were shared with the entire group and are compiled as follows without listing by priority or grouping actions that might be similar.

Academia

- Universities broaden reward systems/incentives
- Universities focus on education with focus on teamwork
- Universities consider exchange positions with industry and government
- Encourage students to develop leadership/communication skills
- Bring in industry/govt guest lecturers or do case studies in classes
- Look at European examples to bring in industry to university education
- Modernize curriculum
- Highlight successful programs like U-TEACH and OU
- Provide mentors for students
- Bring in K-12 teachers to geo dept to help them understand the field
- Certification of geoscience depts
- Faculty work more closely with industry geoscientists to understand workforce needs
- Sponsor forum with administrators, explain importance of geo
- Change mentoring – scale-down mentoring: old-young
- Start with small problems and solve them, use method for bigger problems

Industry

- Focus financial support for geo education and also for research
- Transfer of data/knowledge that is not proprietary
- Industry should advocate for federal research support
- Industry should offer to go to schools and provide education/information to students (formally, informally and in the field)
- Show schools that industry is environmentally-responsible and also industry helps with clean-up
- Sponsor field trips
- Sponsor GK-12 initiatives

- Change negative perspective
- Use industry marketing for academics/govt
- Message that geoscience is not just one industry, but many
- Burn-out prevention, don't let geoscientists leave industry

Government

- Reach out to academics/industry about employment opportunities
- Collaborate more with industry projects (trust)
- Educate govt/ac about research accomplishments of industry
- Govt funding for education about geoscience fields
- NSF funding for workshops and research
- Incentive programs for teaching geoscience
- Develop a plan for geoscience education/standards

Societies

- Societies should collaborate more effectively
- Societies should advocate about govt research to Congress
- Societies should help market R&D and education (through media and other venues)
- Societies organizing visits to schools by their geoscientists-members (what geoscientists do as a profession)
- Societies should continue and do more mentoring of students, particularly at annual meetings
- Continue Geo-Corps at NPS
- Continue Earth Science Week kits and other tools for geoscientists to take into classrooms
- Inventory of best practices
- Develop success metrics
- No sniping among societies
- Providing a global perspective vs US through international societies
- Utilize modern tech, like podcasts and facebooks
- Participate in science fairs and with community groups, like the girl scouts
- Need to look outward beyond geoscience, include other STEM fields

6.0 Summary and Wrap-Up

In closing, Pat Leahy described AGI as a broker between industry and government. He encouraged professional societies to maintain objectivity and speak collectively in order to facilitate the exchange between government and industry. He recognized that a national media campaign, though prohibitively expensive, could be very successful in raising the profile of geoscience issues. Pat also highlighted the importance for developing metrics to track the success of any actions taken to advance geoscience issues. The group agreed to prioritize the list of actions items via email and to act upon them at a later date.