

Testimony before the
House Committee on Science
by
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Thank you for the opportunity to appear before you today on behalf of the American Association for the Advancement of Science (AAAS) to discuss scientific and technical advice for Congress. AAAS is the world's largest multidisciplinary scientific society and publisher of the journal, *Science*. AAAS was founded in 1848, and represents roughly 10 million individuals through its members, affiliated societies and academies of science.

Congress is increasingly addressing complex scientific issues. Last week alone, the House and its committees addressed – among other topics – stem cell research, climate change science, voting technology, fuel cells, and agricultural policy. Over the past year, the list expands to include intellectual property, avian influenza, bioterrorism threats, research priorities in aeronautics, and ocean resource management.

Few Members of Congress, with the notable exception of several members of this committee, and relatively few congressional staff, have backgrounds in science. Do adequate resources exist for Congress to address these issues? From our perspective, the answer is no. Information is abundant, but objective, timely, policy-relevant analyses are in short supply.

The increased use of technology and the Internet have revolutionized the way in which people and organizations communicate with elected officials. A recent study found that Congress received four times more communications in 2004 than it did in 1995. Virtually all of this increase is from Internet-based communication. The average congressional

staffer (of which there are over 10,000) receives 200 emails each day from advocacy groups, constituents, and colleagues¹.

How can a Member of Congress, as busy as he or she is, digest this enormous amount of information, and assess its validity? Many scientific assessments are conducted or funded by entities that have a financial or political interest in the issue at hand. Funding from such groups or organizations is often perceived to affect the study's findings. Conflicting reports from groups with different viewpoints can make it difficult to determine the scientific consensus, particularly for those not deeply familiar with the nature of science, the peer-review process, the definitions of scientific consensus, and principles of uncertainty. Furthermore, a key challenge for members and their staffs is to use the information and assistance provided by interest groups without becoming bound to their agendas. In the words of one observer, "interest groups usually have their own ideas about proper allocation, and they seldom coincide with Congressmen's predilections."²

Nonpartisanship, objectivity, and responsiveness to Members' requests make Congressional support agencies, such as the Government Accountability Office (GAO), the Congressional Budget Office (CBO), and the Congressional Research Service (CRS), valuable resources, though they are not solely dedicated to science and technology. One explanation of members' overall positive appraisal for the agencies may lie in an observation by Davidson and Oleszek:

"Unlike committee or personal aides, these agencies operate under strict rules of nonpartisanship and objectivity. Staffed with experts, they provide Congress with analytical talent matching that in executive agencies, universities, or specialized groups".³

¹ Fitch, Brad and Nicole Griffin, *Communicating with Congress: How Capitol Hill is Coping with the Surge in Citizen Advocacy*, Congressional Management Foundation, 2005.

² Arnold, R. Douglas, "The Local Roots of Domestic Policy," in Thomas E. Mann and Norman J. Ornstein (eds.), *The New Congress* (Washington: American Enterprise Institute, 1981), pp. 250-287.

³ Davidson, Roger H. and Walter J. Oleszek, *Congress and Its Members*, 3rd ed. (Washington, DC: CQ Press, 1990)

CRS reflects its base in the Library of Congress by providing quick responses to thousands of congressional requests annually for factual information, as well as providing policy research and analysis. Its reports are useful, but its ability to provide synthesis is limited. Though it has the ability to conduct scientific and technological assessments, GAO's work reflects its traditional major focus – eliminating waste and fraud and improving program performance. At its current staffing levels, GAO can only complete one to three technology studies per year⁴.

Though they are not congressional support agencies, the National Academies and National Research Council respond to approximately 10-20 requests for studies from Congress each year. Though reports can sometimes be completed quickly, the process generally takes 12-18 months. These authoritative studies that involve distinguished scientific experts writing peer-reviewed reports tend to be most useful for in-depth treatment of long-term issues.

Other large-scale assessments, including international projects such as the Millennium Ecosystem Assessment and Intergovernmental Panel on Climate Change (IPCC), provide in-depth assessments of the current state of knowledge on broad topics. The IPCC aims to provide information that is policy relevant but not policy prescriptive. Similarly, ongoing executive branch research efforts such as the Climate Change Science Program use experts to determine the scientific consensus on key issues. However, these large-scale projects are seldom conducted on a time scale that is consistent with the needs of Congress.

One resource available to Congress is the Congressional Science Fellows program. Begun in 1973 by a group of scientific and engineering societies led by AAAS, this program provides an opportunity for approximately 35 Ph.D.-level scientists and engineers to work as professional staff in congressional offices for a year. Fellows' stipends are paid by scientific societies, making them a free source of expertise for Members. Many Fellows catch "Potomac Fever" and remain in Washington as full-time congressional staff, continuing to provide a scientific perspective on policy issues.

⁴ Kelly, Henry *et.al*, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States*, Federation of American Scientists, 2004.

Over the years, many Members of Congress have indicated how valuable they find the program. For example Rep. John Peterson (R-PA) noted that "Congressional Fellows have played a key role on my staff ... and the knowledge and expertise which they bring to the table has been a tremendous asset when dealing with science and technology issues." Senator Harry Reid (D-NV) added that Fellows in his office "have made critical contributions to a wide range of legislative and oversight projects, including health, environmental, educational, technological, economic and security issues." Nevertheless, the relatively small number of fellows means that the percentage of staff with a scientific background remains low.

Universities and scientific societies, including AAAS, have expanded efforts to bring accurate scientific information to Congress through reports on policy-relevant topics, position statements, and scientific briefings. These activities are often limited by funding. In addition, scientists are often cautious about providing policy analysis on scientific issues, sticking instead to providing scientific data, limiting their ability to inform decisions in a meaningful way.

To sum up, information is not in short supply on Capitol Hill, but *information is not knowledge*. Credible sources are needed to provide timely analysis and synthesis of scientific and technical information as a foundation for Congressional decisions.

These concerns are not new. A 1970 report found that Congress lacked sufficient "independent sources of scientific and technical advice."⁵ This realization led to a number of important organizational innovations. The even greater role of science and technology in today's society demands that we seek innovative methods suited to 21st Century needs to provide Congress with objective, timely, policy-relevant analyses – that is, knowledge that Members can use.

⁵ von Hippel, Frank and Joel Primack, *The Politics of Technology: Activities and Responsibilities of Scientists in the Direction of Technology* (Stanford, 1970)

About the American Association for the Advancement of Science (AAAS)

The American Association for the Advancement of Science (AAAS) is the world's largest multidisciplinary scientific society and publisher of the journal, *Science* (www.sciencemag.org). The non-profit AAAS (www.aaas.org) is open to all, and our members come from the entire range of science and technology disciplines. *Science* has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of over one million. AAAS fulfills its mission to “advance science and serve society” through initiatives in science education; science policy; international programs; and an array of activities designed both to increase public understanding and engage the public more with science. Programs designed to provide Congress with scientific resources include:

AAAS Science & Engineering Policy Fellowships. The Science & Technology Policy Fellowships (<http://fellowships.aaas.org/>) began in 1973 with seven Fellows serving in congressional offices, providing their scientific expertise to policy-makers facing increasingly technical legislative issues. The ensuing decades have led to the establishment of AAAS Science & Technology Policy Fellowships in nearly a dozen executive branch agencies.

The fellowships provide the opportunity for scientists and engineers, from recent PhD recipients to senior-level professionals, to learn about policy-making while contributing their knowledge and analytical skills to the federal government. About 30 other scientific and engineering societies participate, selecting and funding their own Fellows.

The Fellows, representing a broad array of science and engineering fields, bring a common interest in learning about the intersection of science and policy, and a willingness to apply their technical training in a new arena. The host offices value the Fellows for their external perspectives and critical thinking skills, as well as for their technical expertise.

Center for Science and Technology in Congress. The Center for Science, Technology, and Congress (<http://www.aaas.org/spp/cstc/>) is one of the principal channels for AAAS communication between the scientific community and the legislative branch of the U.S. government. It was established in 1994, under an initial grant from the Carnegie Corporation of New York. The Center's primary function is to facilitate communication between the science and engineering community on the one hand and the legislative community and the public it represents on the other.

AAAS's inclusiveness and breadth of coverage among fields of science and engineering enable it to both draw upon and reflect the views of virtually the entire science and technology enterprise. The Center's multifaceted strategy is a strong example of how AAAS approaches its mission and long-term goals. It reports on S&T-policy relevant news through the monthly newsletter *Science & Technology in Congress*; the Center organizes congressional briefings; it provides Policy Briefs on critical scientific issues facing policymakers; and it assists in the preparation of AAAS formal statements and resolutions, congressional testimony, and letters to the executive and legislative branches of governments. Its activities reach out to Members of Congress and staff, AAAS affiliates, academic institutions, science attaches, and the media.

Center for Science, Technology, and Security Policy. The Center for Science, Technology and Security Policy (<http://cstsp.aaas.org/>) was established by the AAAS through support from the Science, Technology & Security Initiative at the MacArthur Foundation. The goal of the Center is to encourage the integration of science and public policy for enhanced national and international security. The Center acts as a portal that facilitates communication between academic centers, policy institutes, and policymakers.

The Center speeds the delivery of balanced technical analysis to Congress, Executive Branch agencies and the public at large through monthly briefings, special reports from panels of technical experts, and partnerships with the broad international network of leading universities, think-tanks, professional societies and nongovernmental organizations.

R&D Budget and Policy Program. Every year since 1976, AAAS has published a report analyzing research and development (R&D) in the proposed federal budget in order to make available timely and objective information about the Administration's plans for the coming fiscal year to the scientific and engineering communities and policymakers. At the end of each congressional session, AAAS publishes a report reviewing the impact of appropriations decisions on research and development, entitled *Congressional Action on Research and Development in the Budget*. AAAS has also established a website (www.aaas.org/spp/R&D) for R&D data with regular updates on budget proposals, agency appropriations, R&D trends in past years, and outyear projections for R&D, as well as numerous tables and charts.

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Albert Teich is director of Science & Policy Programs at AAAS, a position he has held since 1990. He is responsible for the Association's activities in science and technology policy and serves as a key spokesperson on science policy issues. Science and Policy Programs, which includes activities in ethics, law, science and religion, and human rights, as well as science policy, has a staff of 40 and a annual budget of about \$9 million. He also serves as director of the AAAS Archives.

He received a bachelor's degree in physics and a PhD in political science, both from M.I.T. Prior to joining the AAAS staff in 1980, he held positions at George Washington University, the State University of New York, and Syracuse University. Al is the author of numerous articles and editor of several books, including *Technology and the Future*, the most widely used college textbook on technology and society, the tenth edition of which was published by Thompson Wadsworth in 2005.

Al is a Fellow of AAAS and the recipient of the 2004 Award for Scientific Achievement in Science Policy from the Washington Academy of Sciences. He is a member of the editorial advisory boards to the journals, *Science Communication*; *Science, Technology, and Human Values*; *Prometheus*; and *Renewable Resources* and a

consultant to government agencies, national laboratories, industrial firms, and international organizations. He is a past chair of the Board of Governors of the U.S.-Israel Binational Science Foundation, where he remains a member of the executive committee; a member of the External Research Advisory Board of the University of California at Davis, the Norwegian Research and Technology Forum in the United States, and the National Research Council's Research and Technology Transfer Committee.

Al is married to Jill H. Pace, executive director of the American College of Real Estate Lawyers. He has three children and three grandchildren. He is an accomplished amateur photographer, has published several photographs, and had a one-man show of his photographs at the Black & White Gallery in Arlington, Virginia, in 2005, and another in the AAAS Science and Art Exhibition Gallery in 2006.