2005–2006 Congressional Science Fellow Report

Feedbacks between Science and Policy: Do they exist?

Nicole Gasparini,
2005–2006 GSA–U.S. Geological Survey Congressional Science Fellow

I haven't actually done a poll, but I have a hunch that if I were to ask scientists about how policy affects science, every scientist would be quick to answer. Funding would probably be the first issue raised, as every scientist has felt the squeeze on national research budgets at some point in his or her career. Some scientists might also bring up visa limitations for foreign students. Others might talk about regulations that affect their work, from how to properly dispose of lab chemicals to limits on where they can camp and hit their hammers. When it comes to how policy affects science, my guess is that scientists would have no shortage of answers.

On the other hand, if I were to reverse the question and ask scientists about how science affects policy, I'm not sure how scientists would reply. I couldn't answer that question before I started my fellowship, but after a few months on Capitol Hill, I have a better idea about the role that science plays in shaping policy.

For example, a year ago I thought that the National Academy of Sciences (NAS) was solely an honorary society for the most distinguished scientists in our nation. It's true that the NAS is an esteemed honor society, but it also plays an important role in the policy process. Abraham Lincoln formed the NAS in 1863 to "investigate, examine, experiment, and report upon any subject of science or art" whenever called upon to do so by any department of the government. In 1916, the National Research Council (NRC) was founded to carry out studies mandated by the government. Scientists volunteer their time to participate in studies for the NRC. The Academies, made up of the NAS, NRC, the National Academy of Engineering, and the Institute of Medicine, play an important role in integrating science into public policy, while remaining independent of any government institution.

I was first introduced to an NAS report when I was asked to write an oversight letter about the radiation standards for Yucca Mountain. According to the Energy Policy Act of 1992, Yucca Mountain can only receive a license to store nuclear waste if it is in compliance with the Environmental Protection Agency (EPA) public health and safety standards. The law directed the EPA to set standards "based upon and consistent with the findings and recommendations of the National Academy of Sciences." In 1995, the NAS issued a report titled "Technical Bases for Yucca Mountain Standards" to guide the EPA.

The original EPA standards for Yucca Mountain set a 10,000 year compliance period for radiation protection. However, a ruling by the U.S. Court of Appeals found that this time frame of regulatory compliance was not consistent with the findings of the 1995 NAS report. In response to this ruling, the EPA recently issued a new draft of the radiation protection standards for Yucca Mountain, but my boss, Congressman Edward Markey, was concerned that the newly drafted guidelines were still inconsistent with the NAS findings. For example, in the new draft, groundwater protection standards are less stringent after 10,000 years even though the NAS report found that peak risks with respect to groundwater contamination "might occur tens to hundreds of thousands of years or even farther into the future." The oversight letter that Rep. Markey sent to the EPA points out the apparent conflicts between the EPA guidelines and the findings of the NAS.

Yucca Mountain has a long history. In 1957, the NAS determined that a geologic repository was the best way to protect the public and environment from the dangers of radioactive waste. In 1982, Congress enacted the Nuclear Waste Policy Act to solve the problem of nuclear waste disposal. In 1983, the Department of Energy chose nine locations in six states for consideration as potential waste facilities, including Yucca Mountain. Originally, the Nuclear Waste Policy Act stated that there would be two waste repositories, one east and one west of the Mississippi River. Transportation of nuclear waste poses a large safety hazard, and Congress determined that having two sites would reduce transportation safety risks. However, Congress amended the Nuclear Waste Policy Act in 1987, making Yucca Mountain the sole site under consideration for a geologic repository.

There are literally hundreds of reports from the National Academies Press on nuclear waste repositories and Yucca Mountain. Whether or not Congress acts based on the findings of these studies is of course up to every individual member of Congress. However, it is heartening to know that scientific studies have been carried out at seemingly every step of the way to help direct congressional decision making. I recently attended a hearing on the status of the Yucca Mountain project and couldn't help but smile when Rep. Markey said "we will not sacrifice sound science for political expediency."

The National Academies are not the only scientific influence on policy. Scientists employed by policy organizations, such as the Federation of American Scientists, the Union of Concerned Scientists, and the Natural Resources Defense Council, also play a role in educating congressional staff. My office works closely with many different science policy groups and welcomes their scientific knowledge, since it would be impossible for any single congressional staffer to thoroughly research

every policy issue. Scientists from these organizations become a resource for staffers, and they are often called upon to testify at hearings and briefings.

Private scientists also visit our office and play a role in educating congressional staff. Some scientists come as part of congressional visits organized by a scientific association, while others contact us individually because they are in our district or believe that our office may support their cause. These scientists often ask us to cosponsor legislation or sign a letter in support of a project, but many times these scientists just want to keep us informed.

I always enjoy meeting with other scientists, and I appreciate seeing science from "the other side." I recently met a seismologist who receives funding from the Air Force Seismic Monitoring Program, which supports research to improve the military's capability to detect clandestine nuclear explosions. My own Ph.D. was partially funded by the Army Research Office, so I am keenly aware of the intersection between basic science and military needs. However, members of Congress often need to be reminded of the practical applications of basic research in order to justify continued spending.

I am happy to report that science does play a role in policy decisions on Capitol Hill, at least in the office of Congressman Ed Markey. Communicating scientific findings to my boss can be a challenge, but it's also my favorite part of the job, and it may be the most valuable lesson I learn this year.

This manuscript is submitted for publication by Nicole Gasparini, 2005–2006 GSA–U.S. Geological Survey Congressional Science Fellow, with the understanding that the U.S. government is authorized to reproduce and distribute reprints for governmental use. The one-year fellowship is supported by GSA and by the U.S. Geological Survey, Department of the Interior, under Assistance Award No. 05HQGR0141. The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. government. Gasparini can be reached at nicole.gasparini@yale.edu.

October in the northeastern United States: Fall colors in the Appalachians are readily visible throughout central Pennsylvania. True-color image taken 28 October 2004 by the Moderate Resolution Imaging Spectroradiometer (MODIS) on the National Aeronautics and Space Administration's *Aqua* satellite. Image courtesy Visible Earth, http://visibleearth.nasa.gov/view_rec.php?id=6742. See the Philadelphia meeting pages in this issue for more about visiting this area.