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Author: HASELTINE, SUSAN D.

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Scientists Should Help Frame the Discussion

SUSAN D. HASELTINE

James Karr's commentary "When Government Ignores Science, Scientists Should Speak Up" (*BioScience* 56: 287–288) makes some strong points concerning challenges every scientist faces as his or her results and conclusions are used in decisionmaking, public policy, and natural resource management discussions. The role of science and scientists in informing, influencing, and evaluating the impact of policy on issues of long-term importance to our economy, human health, national security, and the health of the ecological systems that sustain our quality of life has been a topic of discussion for decades.

As Dr. Karr points out, recent debates about the interpretation of scientific information available to decisionmaking on such issues as climate change and implementation of the Endangered Species Act have raised concerns about society's use of scientific data. Although more scientists and professional societies are involved in generating information and positions than at any time in recent history, the weight given to their contribution in decisionmaking seems to be declining. Moreover, Karr raises concerns about data that are ignored or suppressed, and scientific results that are distorted or misrepresented.

In fact, scientific information is just one factor in decisionmaking pertaining to complex issues that will affect the health of our landscapes, economy, and population. A central question, aside from the rare case of deliberate lack of integrity concerning evidence provided to policymakers, should be restated as "How can scientists be most effective in communicating their results and the complete body of scientific evidence available to all stakeholders in our society?"

There are several important actions that scientists must invest in if scientific information is to be more effective in influencing policy development and decisionmaking. First, scientists must interact more actively with policymakers and all affected stakeholders in determining the specific science questions that society decides should be addressed. Answering critical questions, filling key gaps in understanding, conveying current science understanding and uncertainties related to policy development in a timely manner, and providing continuing communication of new knowledge to all stakeholders are critical to the use and influence of science in public debate.

It is also important that scientists bring the full record of relevant science to the questions of policymakers, that they identify both strengths and uncertainties in knowledge, and that they convey conclusions or recommendations that the full body of scientific evidence warrants, as well as any evidence that may contradict the accepted view. Weak public policy can result when relevant scientific information is not widely available. For example, scientific information central to decisionmaking when the northern spotted owl was considered for listing under the Endangered Species Act was available but not widely disseminated in the 1980s. The decision not to list the owl was challenged in court; ultimately the species was listed, but only after delay that resulted in further loss of habitat and increased recovery costs.

Second, it is important to convey information in a format and style that is "user-friendly" to all parties involved. Two examples Dr. Karr cites illustrate this point. In the 1960s, Rachel Carson summarized and eloquently conveyed information from a body of research on organochlorines and wildlife populations, starting with the introduction of DDT before World War II. As a result, the risk of these chemicals was made real to many members of the public who formerly had seen only health and agricultural benefits from those chemicals. The banning of lead shot was the result of 20 years of research and discussions on the effects of lead on ducks, raptors, and other waterbirds. Only when scientific evidence was conveyed to bird conservationists and hunters weighing the benefits of the ballistic properties of lead against the resulting secondary poisoning in eagles and osprey, long-term effects of ingestion by feeding waterfowl, and wetland contamination did the conversation influence policy. All stakeholders must assess risks and benefits of policies and decisions on the basis of their own values and needs. Conveying science results in formats that inform all stakeholders in the broadest ways possible is critical to scientific influence in decisionmaking. Therefore, scientists must be a part of the discussion from formulation to result in order to build the trust and relationships needed to effectively communicate complex scientific understanding.

Third, scientists must support robust, transparent review processes in journals and government decisionmaking. All scientists are alert to new findings and ideas within their own area of science. Peer review has long been both a pillar of scientific discussion in the open literature that generates those ideas, and it is critical to wide dissemination of both con-

Susan D. Haseltine (e-mail: susan_haseltine@usgs.gov) is Associate Director for Biology, US Geological Survey, Reston, VA 20192.

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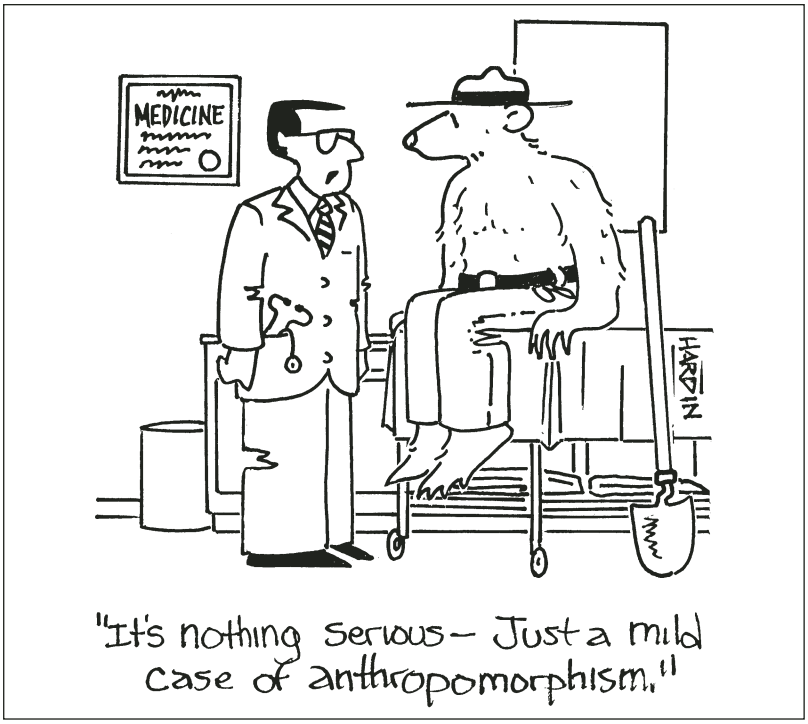
sensus and innovation in scientific understanding. Peer review and publication in open journals is essential to maintaining scientific rigor and integrity and establishing a record of evidence that informs policy development. It establishes the scientific knowledge base and lessens the risk that critical data and evidence will be overlooked or discounted by policymakers.

Synthesis of scientific thinking, as well as innovation and challenges to accepted theory, can be documented only by strong review and discussion within the science community. The results and consensus of this scientific discussion are strengthened by open peer-review processes. Scientists must be proactive about bringing these same open review processes to discussions of the science base that informs government policy and decisionaking. They must support and participate in strong reviews sponsored by government agencies in decisionmaking processes, and they must insist on updating the science base as decisions are reviewed or used in further deliberations. They must think broadly about appropriate expertise needed in these reviews. For example, in dealing with decisions or policies concerning predators, one might recommend species and landscape modelers, population ecologists, and geographers, along with the appropriate species or taxonomic experts, to review a wide suite of scientific information.

As Dr. Karr emphasizes, all scientists, and especially those in government service and at land grant universities, have an obligation to enter the dialogue if they think their science has been misrepresented by policymakers. Clarifying the issue and stating specifically where and how information was distorted—and what the implications are for policy decisions—add value to the public discussion. All interested stakeholders should be informed so the full record of science is available before any party makes recommendations to policymakers. While entering a public dialogue about possible misrepresentation of science is never a pleasant prospect, the risk to government scientists as they enter this discussion is no greater than that to other responsible public employees addressing concerns about decisionmaking in their organization.

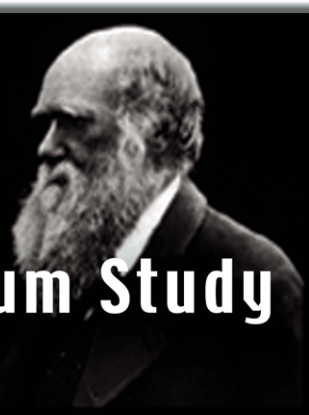
Results of scientific discussion and debate are central to the evolution of many public policies. The richness and complexity of these discussions are often miscommunicated to decisionmakers as weakness or disagreement in underlying consensus on big science themes. Science, especially science concerning human health or environmental and ecological decisions, rarely explains 100 percent of uncertainty. But if presented in terms that are value free and nonprescriptive regarding policy options, the scientific work informing a policy can be weighted and evaluated in relation to the decision at hand. Not providing this comprehensive analysis of available information and ideas increases the risk that scientists will be identified as just another special interest group.

Scientists must be more proactive in advocating the complete science record in public discussion, and they must serve as unbiased providers of that record to all stakeholders to be effective in the long term. The role and strength of scientists is conducting innovative science relevant to society's critical needs and questions, and reporting results in a way that informs the public. Doing so will make scientists a valued resource to all sides in the complex public conversations informing decisions and policymakers.



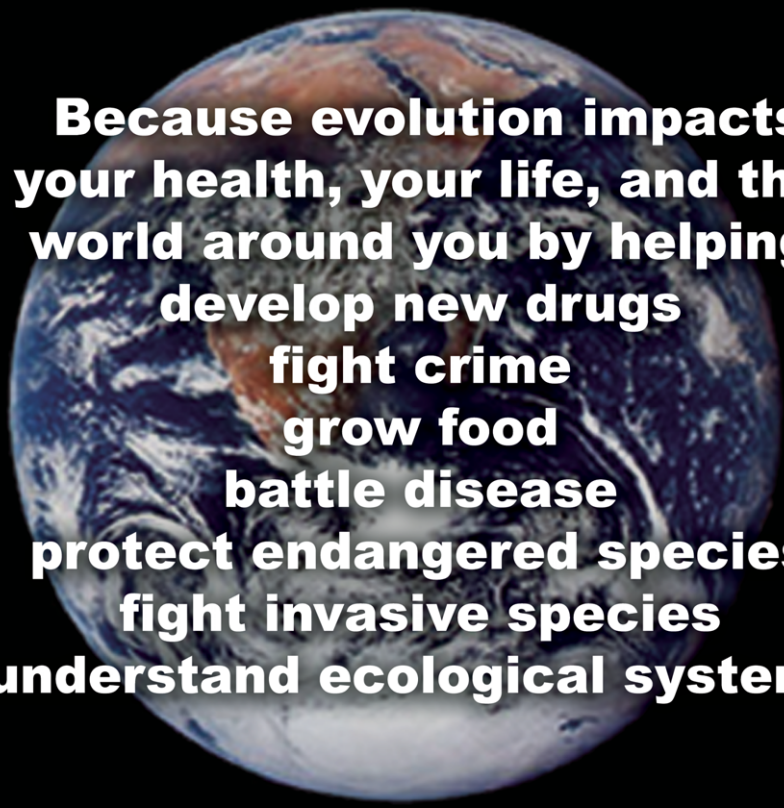
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