Addressing environmental challenges and controversies through science communication

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What can we do for the environment? What can individual scientists, agencies and institutions do to improve the quality of environmental decision-making? These are among the questions explored by scientists and communications experts in a Special Issue of the Ecological Society of America's (ESA) peer-reviewed journal *Frontiers in Ecology and the Environment*. Submissions are based on a 2009 conference held at the Cary Institute of Ecosystem Studies.

We can communicate effectively

Scientists need to consider their audiences when talking about their research. Members of the press benefit from concise and clearly-explained research just as much as their readers do. In his guest editorial "Into the Breach," Andrew Revkin, writer for The New York Times' blog Dot Earth and Senior Fellow for Environmental Understanding at Pace University, cites the challenges of science communication "in this world of expanding, evolving communication paths." The public is growing wary of science, he notes, because of the occasional misrepresentations from the media. Journalists do not shoulder all of the blame, however, says Revkin. Scientists should strive to be more proactive with sharing evidence-based information, reaching out to science communicators, policymakers and the public.

In the article "Communicating with the public: opportunities and rewards for individual ecologists," Michael Pace from the University of Virginia

and colleagues explain how scientists can engage non-academic audiences in their work. Researchers should recognize and pursue opportunities for public outreach, and perhaps more importantly, their institutions should acknowledge such efforts in merit evaluations. In addition, Deanna Osmond from North Carolina State University and colleagues outline the benefits of working with interface organizations—typically, nonprofits committed to disseminating and translating science for the media, stakeholders and policymakers—in "The role of interface organizations in science communication and understanding."

"The gap between scientists and decision makers is well-known and well-established," says Peter Groffman, from the Cary Institute of Ecosystem Studies and Guest Editor of the Special Issue, "but it is not impossible to overcome. Interface organizations, for example, can be critical tools for connecting research to untapped audiences using the most effective outreach strategies."

We can inform policy with science

There are other benefits to scientists clearly communicating evidence-based information to the public, says Gene Likens from the Cary Institute. In his long bid to spur legislation addressing acid rain, Likens used several outlets, such as the media, to translate his research and relay his message. In his online-only article, which also forms part of the Special Issue, "The role of science in decision making: does evidence-based science drive environmental policy?" Likens cites his experiences with acid rain as a case study for the successful inclusion of science into policy making.

As he writes in the article, "communication is frequently hindered because scientists and non-scientists 'speak different languages,' the former often using acronyms and specialist jargon." He strongly advises

scientists to tailor their message for policymakers, as opposed to the more "technically-oriented managers." In short, he says, for the message to reach policymakers and for them to be able to reference it, "scientists need to have unassailable data, perseverance, good communication skills and an understanding of policy."

We can educate children through the arts

Children can become alarmed as they learn about the widespread environmental challenges society faces. According to Diane McKnight from the University of Colorado, Boulder, this effect, called ecophobia, can be counterproductive in inspiring children to explore nature. In another online-only article "Overcoming 'ecophobia': fostering environmental empathy through narrative in children's science literature," McKnight recommends children's books and fictional tales that both describe the wonders of Earth and describe the science behind these natural processes.

Similarly, in "Four cultures: new synergies for engaging society on climate change," Matthew Nisbet from American University and colleagues emphasize the importance of integrating the multi-disciplinary expertise of the four major academic cultures—including environmental science, philosophy and religion, social sciences and the creative arts—to more effectively communicate about environmental issues.

"Right now, in their outreach efforts the four major disciplinary cultures tend to work in isolation," says Nisbet. "What we need is a new system of incentives and rewards at universities and at funding agencies that allows these disciplines to accomplish collectively what none are capable of doing alone, namely, building a new communication infrastructure surrounding climate change, especially at the local level."

Nisbet and colleagues specifically recommend increasing the proportion of research grants dedicated to public outreach, suggesting that the funding from individual grants should be pooled at the university level. These resources, say the authors, would be invested in a four cultures faculty committee committed to maintaining local partnerships with the media, museums, libraries, schools, businesses and faith-based organizations. The goal would be to engage all corners of society in environmental efforts.

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