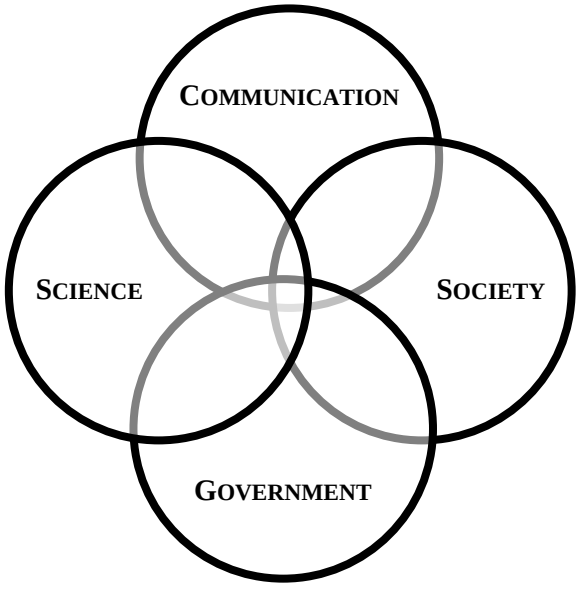
ADVOCACY IN SCIENCE

Summary of a Workshop convened by the
American Association for the Advancement of Science
Washington, DC
October 17-18, 2011



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Preface

This report is a summary of the views and suggestions expressed by attendees at the workshop on "Advocacy in Science," held in Washington, DC on October 17-18, 2011. An earlier draft was reviewed by the participants, and their comments and suggestions were considered in preparing this final report. However, AAAS project staff retains full responsibility for the content of the report.

As a summary, the report is not intended to be inclusive of all distinct comments made at the workshop or in reviews of earlier drafts. Neither is it offered as a definitive statement on the issues it covers. The subject matter on which it focuses is complex, nuanced and, in some quarters, contentious, and readers are encouraged to supplement their reading of this report with other resources, some of which can be found on the AAAS web site at http://srhrl.aaas.org/projects/advocacy/workshop/resources.shtml.

This summary does not reflect the official views or policies of either AAAS or the National Science Foundation, which funded the workshop.

Acknowledgments

Many people contributed to our work on advocacy in science that has led to this report. First and foremost are members of the AAAS Committee on Scientific Freedom and Responsibility, who organized and/or participated in four meetings between 2006-2008 that laid the groundwork for the workshop. Participants in the 2011 workshop were major contributors, both by their participation in that meeting and in their comments on earlier drafts of this report. A list of the participants can be found at http://srhrl.aaas.org/projects/advocacy/workshop/index.shtml#Participants. A special debt of gratitude is owed to Rebecca Carlson on AAAS staff; she created the web site for this project and handled numerous logistical matters associated with the workshop and production of this report. Staff members Jennifer Sta. Ana and Nicole Carlozo also made valuable contributions.

Over the years in which AAAS staff was planning and conducting work on advocacy, a number of interns assisted with background research and participated in staff discussions on the topic. These included: Katie Alijewicz, Rebecca Friedman, Caitlin Gamble, Katherine Goodman, Brent Hagen, Anna Ing, Elizabeth Ingianni, Emil Kiner, Elizabeth Lee, Cassandra Leigh, Meghan McCabe, and Lindsay Pascal.

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The workshop on advocacy in science held at the American Association for the Advancement of Science (AAAS) on October 17-18, 2011 was sponsored by the AAAS Scientific Responsibility, Human Rights and Law Program (SRHRL) and funded by the National Science Foundation. Attendees included researchers from the natural and social sciences, representatives from scientific societies and advocacy organizations, and scholars who have studied advocacy. It was the culmination of a long series of activities undertaken by the AAAS Committee on Scientific Freedom and Responsibility (CSFR). These activities included two CSFR "topical" meetings held in 2006 and 2007, followed by symposia at the 2008 AAAS Annual Meeting and the AAAS Forum on Science and Technology Policy. Committee and staff used these events to explore a broad array of views by speakers from diverse backgrounds.

Based on those meetings, Committee members and staff were able to derive the following observations that would eventually inform subsequent work:

- Defining *advocacy* is both important and elusive, as the term can mean quite different things to different people and institutions;
- Scientists are increasingly being encouraged by people inside and outside science to become engaged with the public policy process;
- A subset of scientists is already "doing" advocacy, with varying degrees of skill, enthusiasm, and support;
- Some younger scientists, including those in graduate school, are expressing increasing interest in how their work will affect the larger society, and are seeking guidance on how best to engage the policy process;
- There are few educational/training materials and venues for learning about and doing advocacy;
- There is also little ethical guidance on how to engage in "responsible advocacy";
- There are few empirical studies in the literature on advocacy in science and what exists is mostly concentrated in a few disciplines.

Following these four meetings, staff and CSFR developed an ambitious three-phase research and education plan (See Box 1). Although the plan seemed sound, it soon became apparent that it was perhaps overly ambitious and that a planning workshop would be prudent. The workshop was intended to solicit advice from colleagues to inform efforts by AAAS if it decides to move forward with the larger project described above, or some other effort.

In order to establish boundaries around a potentially large universe of advocacy activities, the workshop planners decided to eliminate from discussion advocacy for political candidates, advocacy by industry, government employees or advocacy as an international endeavor. Given those boundaries, the goals for the workshop were:

Box 1.

- Phase 1: Build a database of examples of advocacy by scientists
- Phase 2: Draw lessons from these examples and work with other scientific societies to normative guidelines on responsible advocacy
- Phase 3: Prepare educational materials on advocacy by scientists

- To clarify the definition of advocacy;
- To set forth the risks and benefits of advocacy, both for the scientists themselves as well as for society;
- To explore whether there is a role for guidelines for scientists engaged in advocacy;
- To make strides in designing a research strategy for the larger project.
- To discuss the role that scientific societies might play in advocacy; and
- To determine what uses there might be for educational materials to instruct scientists and science students as they contemplate engaging in advocacy.

Although the workshop was conceived as a preliminary step to a larger project, it will have value and visibility as a stand-alone event through the products it generates (see Box 2).

Box 2.

- Summary workshop report
- Commissioned papers
- Website
- Resources on advocacy
- Inventory of scientific societies' advocacy activities

Defining Advocacy

Although seemingly a simple question, participants struggled to arrive at a definition with which all could agree. While a clear consensus was not achieved, the discussion brought forth several dimensions to the concept of advocacy.

One familiar realm of advocacy by scientists surfaced early in the discussion, namely advocacy within the scientific community, or internal advocacy, which is not aimed at communicating to a larger public. This includes advocating on behalf of students, applying for a grant or trying to persuade colleagues of your point of view by, for example, presenting a paper at a professional meeting. Workshop participants recognized that, while scientists are comfortable in this internal realm, they are less so in the wider public arena.

In the public arena, a definition that generated wide agreement was that advocacy is attempting to influence a specific outcome, to tell an external stakeholder, "This is what you should do!" It is a deliberate, purposeful public expression of an opinion or point of view. In this understanding, it is using one's scientific position and expertise to accomplish a specific policy goal, whether the advocacy is directed at the public or at a policymaker. Although not a popular view at the workshop, one participant likened it to a salesperson selling a product: in both instances you stress the data that support your opinion and disregard data that do not. An implication of this definition is that "science" and "advocacy" are clearly separable activities: When you "do" science, you investigate, report, explain, and interpret; when you urge a course of action, you are "doing" advocacy, not science.

In addition to the internal/external dichotomy, a further distinction was made between advocating for *science* and advocating for *policy*.[1] Advocating for science can include seeking resources/funding to advance the scientific enterprise, and arguing for giving science a greater voice in public policy debates. In fact, attendees generally agreed with the proposition that the scientific community should seek to be more involved in public debates related directly to

[1] In this report, discussions of advocacy refer to "advocacy for policy" unless otherwise noted.

science and that there should be more opportunities, incentives and "capacity" for scientists to do so. However, scientists should bear in mind that policy decisions involve more than science. Policymakers must also consider societal values, cost, and political realities.

With respect to advocating for policy, one view expressed was that it is one thing to bring scientific expertise to bear on an issue of public interest but altogether different to recommend specific legislation or a specific policy outcome. In the public's mind, the latter might be considered "lobbying" and viewed negatively. Further, when scientists "cross the line" between advising and advocating, it can confuse both the science and the policy. However, after further consideration, even the distinction between advising and advocating became muddy. Sometimes expressing an opinion on a matter of public interest obviously points to a particular policy outcome, that is, the science and a specific policy are so close, the listener (the public) will not know the difference. Further, as someone noted, scientists might become embroiled in advocacy "accidentally," as when they or others realize the results of their scientific research have crucial consequences. Another participant put forth the view that an advocate is someone who "pleads" for another person, and scientists have the obligation to plead for the public good.

Further, as pointed out in Dan Sarewitz's[2] paper, the context in which a scientific opinion is communicated is important; if the context changes, the nature of the advocacy changes, although the scientist has done nothing different. In this scenario, what started as communication of scientific information on a general point of public concern can become out-and-out outcome specific advocacy if, for example, legislation is proposed. The latter considerations led some to point out that advocacy is a spectrum of activities and resembles a continuum more than a dichotomy. There is always a possibility the different activities, while conceptually distinct, will blend into each other. This thought led back full circle to Sarewitz's thesis, that advocacy is what scientists do as sentient human beings, that it is an inescapable aspect of being a scientist. He posited that we live in a time of "post-normal" science, which occurs when the policy stakes are high, the science is uncertain, and the values are disputed. Further, the institutional setting in which advocacy occurs can change the tenor of the advocacy. Sarewitz described a situation in which scientific information and societal values become entangled. This led participants to note that advocacy is only troublesome when disputed values are central to the policy dilemma and the science is uncertain, and that scientists have to be careful not to try and "scientize" a policy debate when what is really at issue is values.

Risks and Benefits of Advocating

The science "trademark" has great value and is used by advocacy organizations, as in "science shows that…." Many workshop participants held the view that, paradoxically, when scientists themselves are perceived as advocates, their views are often discounted, even if they are being objective. Further, that discount can threaten the perceived legitimacy of the advocate's field.

As noted above, advocacy can be seen as too much like lobbying, like being a salesman or, as one participant put it, if science and advocacy are perceived as polar opposites, it makes advocacy seem like a "dirty thing." This view makes advocacy a very unattractive option for

[2] Daniel Sarewitz, "Science Advocacy Is an Institutional Issue, Not an Individual One." http://srhrl.aaas.org/projects/advocacy/workshop/Sarewitz.pdf

scientists, especially because, someone remarked, scientists look on anything other than science as several steps below an "Olympian height."

In addition to muddying the waters between science and policy making, workshop participants acknowledged another way that advocacy can be problematic for scientists because it poses the temptation of distorting or tainting the science or substituting a personal opinion for a scientific one. Most seriously, if scientists become advocates they risk losing their good name as scientists. One participant put it bluntly, "If you want to be seen as a scientist, act like a scientist."

Not so fast! Another participant replied that she doesn't cease to be a scientist because she has an opinion. That seems obvious because everybody, including scientists, have opinions. But what if the opinion is about a specific policy and the scientist expresses that opinion in a context where policy is being debated publicly? In fact, the above arguments against advocacy were balanced at the workshop by equally strong champions of advocacy. For example, one participant pointed out that scientists are citizens first and foremost, and they have a duty to be involved in societal issues, not to mention advocating for science itself.

This led to a discussion of some differences between science and advocacy. If the hallmarks of science are accountability, fairness, and honesty, then those traits may be incompatible with effective advocacy. The standards of the democratic decision-making process are in some ways in opposition to the standards of science. Democratic decision-making values egalitarianism; science favors expertise. Democratic decision-making values a plurality of viewpoints; science leans heavily on the weight of the evidence. Holding a scientist to the rules of democratic decision-making, in short, "cripples" the scientist.

Nick Steneck, in introducing his draft report, noted that in a very unscientific survey he conducted with scientists and science students, they all said that scientists *should* be advocates.[3] Along these lines, a participant suggested that conducting research in a post-normal world is advocating or, stated otherwise, conducting "use-oriented" science. But Steneck also noted there is a portion of the scientific community that believes strongly that the issue of social responsibility be considered separately from responsible conduct of research. This would seem to leave the question of whether scientists *should* be advocates a matter of personal choice. Yet others noted that "science is embedded in society and that society should have a say in how it wants scientists to behave," and increasingly the larger society wants scientists to be engaged.

Guidelines for Responsible Advocacy

In his remarks on responsible advocacy, Steneck exposed a dilemma. *Should* we separate the rules for responsible advocacy from those for responsible research, and *can* we separate them? Presenting advocacy as a different activity from science – jumping from investigating and explaining to urging a particular outcome – would seem to call for a distinct code of conduct for advocates. Indeed, Steneck set forth one basic rule: be clear about when you are in the role of an advocate as opposed to a scientist. For discussion purposes, he proposed starting with the code of responsible conduct of research, particularly as set forth in the Singapore Statement, developed

[3] Nicholas Steneck, "Responsible Advocacy in Science: Standards, Benefits and Risks," http://www.shrl.aaas.org/projects/advocacy/workshop/Steneck.pdf

at the Second World Conference on Research Integrity in 2010. But if the activities of science are distinct from advocacy, could a code of responsible conduct of research also serve as a guideline for advocacy?

Guidelines for scientists, such as codes of conduct, include the principles of honesty, accountability and fairness. When scientists communicate with the public, good practice requires being clear about uncertainties, presenting competing views or interpretations of data, and stating the limitations of the data you present. However, communicating is not necessarily advocacy. In fact, advocacy can best be thought of as a subset of communication, given the earlier definition of advocacy as urging a particular policy course.

How good is the fit between the guidelines or rules for communicating about science and advocacy? One participant said that he did not want his advocate to be fair, to state the limitations of the data, or to present competing views. He wanted his advocate to advocate! Clearly, the principles of the responsible conduct of science, guidelines for science communication, and effective advocacy *can* conflict. But does "anything go" in the world of advocacy, or are there some guidelines for responsible advocacy?

Box 3.

- Limit science advocacy to your area(s) of expertise and be clear when you are presenting a personal opinion not based on your formal expertise or professional experience;
- Present information clearly and avoid making exaggerated claims;
- Be aware of any conflicts of interest – for example, financial interests that you or members of your family have or affiliations with advocacy organizations – and make them clear; [5]
- Point out the weakness and limitations of your argument, including data that conflict with your recommendations;
- Present all relevant scientific data, not just that which supports a particular policy outcome;
- Be aware of the impact your advocacy can have on science; and
- Make clear when you are speaking as an individual scientist as opposed to acting as a representative of a scientific organization. [6]

The above argument notwithstanding, most participants agreed that the rules of responsible advocacy do track closely with the rules of responsible conduct of research. If those rules seem too general and hard to pin down it may be, as someone suggested, that when you try to write broadly based rules for a large audience, it is inevitable that they are going to be "thin." This is so because if you try to add too much specific content to them, you will never get agreement and there will be important exceptions emerging frequently.

In his draft paper, Steneck presented "guidelines for advocacy" to stimulate discussion (See Box 3).[4]

[4] In his final paper, Steneck offers revised guidelines.
[5] When scientists advocate for *science* (for example, for funding), as opposed to *policy*, they always have a conflict, according to Steneck.
[6] In fact, one idea that arose during this discussion was that scientists might avoid some of the pitfalls of advocacy if they advocate through a science society that is knowledgeable on the issues in question.

Designing a Research Project

A motivating factor in convening this workshop was AAAS's realization that developing guidelines for responsible advocacy, as well as producing teaching materials, would not be possible without a greater understanding of what "doing advocacy" by scientists actually entails. Clearly, more empirical information is needed. AAAS staff originally envisioned a database of examples of advocacy, and sought advice on what the contents of that database should be. In other words, what sort of data would be needed? Examples could include how scientists behaved, what the state of the particular science was, or what the venue was. The database would be available to scholars and educators for research and teaching. Further, the cases might point in the direction of meaningful guidelines and allow the exploration of questions like those posed in previous sections. Indeed, one participant asked if we were looking for examples of successful advocacy or examples of responsible advocacy, which might not be the same.

Three targets for an empirical study were identified: scientific societies; individuals involved in advocacy; and the issues that generated the advocacy.

Scientific societies: Some participants thought it would be useful – and manageable – to assemble an inventory of how scientific societies are addressing advocacy. Areas of interest could include their official positions on advocacy, materials they use to educate both students and their colleagues in the discipline, and what they consider to be best practices for their members who become involved in advocacy. Aside from being a manageable piece of the larger issue of advocacy by scientists, this method of proceeding has the following advantages: it avoids the challenge of defining "advocacy" by simply accepting a society's operational definition; it makes it possible to draft guidelines and teaching materials based on the best examples drawn from the societies; and it takes advantage of AAAS' strength as a federation of scientific and engineering societies.

Individuals: Other participants thought the interesting piece of the puzzle was the individual scientist who engages in advocacy. This strategy would explore what motivated scientists to become involved as advocates, whether some could be called "accidental" advocates (as defined above), and whether scientists sometimes choose research topics intentionally in order to contribute to issues of public dispute. One type of study proposed was to concentrate on scientists who become the center of a controversy and on "bad" or "good" examples, which would contribute to our understanding of what can go wrong or right and how to discourage or encourage it.

Issues: Others favored employing issues themselves as the organizing principle of the database. Although many participants found this to be an attractive strategy, it raised a number of methodological problems, foremost among them being how issues would be chosen. One attendee warned of selection bias in this regard. Another suggested polling science policy experts and asking them to nominate, say, ten instances of science-rich public policy issues for inclusion in the database. Another contended that simply accumulating cases would not be illuminating, and that a comparative case approach be adopted.

But a more basic question was whether an empirical study could be designed at all. Several participants thought that a research project could not go forward until we "identified what the problem is," that staff was putting the cart before the horse. You cannot build a database without a clear statement of the objective. Furthermore, a problem with collecting a lot of cases is that each one will be unique, so that it will be difficult to select the parameters to use as data points. Finally, trying to design a study raises all the problems chewed over in the workshop's first session, most importantly, *what is advocacy?*

Fortunately, the gloom was relieved by the optimists in the room. They observed that not everything in science is experimental, and this particular study of advocacy is a descriptive effort that will be inductive, generalizing up from the individual cases. One participant recommended that we need not worry about specific research questions before collecting data. Rather, once we have a database that is complex enough to allow classifications to be identified, then scholars from different disciplines will have a rich source of information and will devise interesting questions related to their area of expertise. (In other words, the cart *should* precede the horse.)

The Role of Societies

Scientific societies are already playing an advocacy role, with most of that effort appearing to be advocacy for *science*. This advocacy includes measures that affect scientists directly, such as R&D funding for their own disciplines, as well as for other scientific disciplines, "elevating public policy discussions" by trying to make certain that science is included in policy deliberations, and gaining respect for scientists' views. Additionally, societies can educate and prod policymakers to call on scientists for help in understanding complex technical issues.

Discussion with society representatives at the workshop also highlighted the role societies are playing in training their members to advocate, whether for science or for policy. Researchers need to understand what the expectations are for scientists in the public realm and to appreciate that they are entering the world of policymakers, not the other way around.

This discussion illustrates the dual role of societies in advocacy. They encourage and help their individual members advocate as individuals, and their members or staff advocate on behalf of the society. Participants noted several ways in which the society as advocate has certain advantages. First, colleagues sometimes "look down their noses" at scientists who enter the public realm, and when scientists are on every side of an argument an atmosphere of personal attacks can be generated. Societies can provide cover for individual scientists by standing behind their opinions and recommendations. Second, in some policy advocacy, the involvement of a scientific society may reduce the appearance or reality of bias. Further, societies – particularly the larger ones – have an infrastructure and resources more conducive to skilled advocacy than do individual researchers. And, as one society representative said, "There's something to the imprimatur of a society." But is there? Are societies viewed as authoritative and trustworthy? Some participants suggested this may not always be the case, especially when they engage in overt advocacy on policy issues.

Educating for Advocacy

Many in the younger generation care deeply about considering the risks and benefits of science to society and may be less apt to think *advocacy* is a dirty word. Yet students are leaving graduate school without the skills to advocate.

Should advocacy be taught as part of the science curriculum?

The first panelist addressing this topic answered with a resounding *yes*. She noted that in many disciplines, advocacy is not being taught. Nevertheless, students in their subsequent professional careers may become advocates, sometimes accidentally, and "if they are going to do it anyway, they should be trained," in order to avoid some of the pitfalls discussed earlier in the workshop. Other panelists agreed that educational opportunities and resources should be more widely available for those who wish to engage in advocacy, but should not be required for all students.

How are we going to teach advocacy?

It will take time and effort to develop curricula on advocacy. First, qualified teachers are needed, such as individuals who have been in the advocacy arena and experts in rhetoric and communication. Second, teaching materials are required, for example, how to communicate with different audiences, as well as case studies and best practices.

To introduce advocacy training successfully into the science graduate curriculum, scientists will have to believe that advocacy is important for their disciplines, that it is a legitimate professional activity among their peers. One route identified is to consider greater involvement in the policy arena as part of a scientist's social responsibilities. This observation led to a repeat of earlier discussions, namely, if the science community is perceived as having a "values-based" agenda, scientists put themselves at risk of losing their credibility and, thus, lessen their potential impact on policy.

For many participants, particularly the "younger" generation, convincing their peers or supervisors that advocacy, or any kind of outreach, is important is a tall mountain to climb. The educational or academic system does not reward this kind of activity. The most important goal in training scientists is to produce good scientists; turning out responsible members of society is a secondary consideration. Advocacy on the part of scientists is usually unsupported, with one participant describing it as bordering on "career poison." Others argued that advocacy education would only gain respect in the scientific community if it were funded. Yet others noted that the public, including policymakers, is increasingly asking scientists to explain and defend their research with regard to its value for society. For some, this was a compelling reason to train students and scientists in how to participate effectively in the public arena.

The majority of participants did not think the curriculum for science students should include a required course on advocacy. On this point, a student in the room was emphatic, saying: "I take 48 hours of classes; the last thing I want to commit to is another class." Further, he noted, he is not likely to be in a position to advocate for "30 years," so teaching him the skills now will not be useful. Another participant pointed out that some students simply would not be good at

advocacy, and should not be encouraged to talk to policymakers. Others viewed the situation differently, observing that senior scientists are concerned with their students' careers and may be open to helping them explore and gain the skills needed to broaden their future possibilities. And while some students should not or will not become advocates, all students would benefit from knowing how decision-making works (or doesn't work).

A required course on advocacy may not be a good idea. However, most participants felt that responsibility to society should be part of an ethics curriculum, and advocacy could be included as one topic in this discussion. Further, students interested in advocacy should be able to attend science communication and advocacy workshops on an opt-in basis.

Final Thoughts

Before adjourning the workshop, attendees were asked to focus briefly on several questions.

In AAAS efforts toward advancing discussions about advocacy, would it be better off seeking a single definition or describing its attributes?

There seemed to be a consensus around not seeking a single definition, and some recommended avoiding the word *advocacy* altogether, given its negative connotations. The general conclusion was that AAAS should concentrate on describing attributes or types of advocacy.

If the credibility and authority of scientists are linked in some way to public/policymaker perception, is that an argument for or against including members of those audiences in the process of developing guidelines and/or teaching materials?

Although a lively discussion ensued, no consensus was reached. On the one hand, it might be useful to seek the views of the audience of advocacy by scientists; however, bringing "outsiders" into discussions about the rules of conduct for one's community entails some "risks" if outsiders challenge the ethical priorities of the community or seek to impose expansive obligations. Yet, to conceptualize the concepts of "responsible" advocacy and "effective" advocacy, reaching out to other communities could prove useful – after all, how do you identify the attributes of "effective" advocacy without consulting the intended audience?

If you believe that scientists/students need resources related to advocacy, where should AAAS put its efforts? Which resources should be given priority?

Some participants expressed the view that it was premature to develop advocacy resources, partly because there was little demand for them. The example of training resources for responsible conduct of science (RCR) was cited as a lesson, namely, that resources were virtually non-existent until the National Institutes of Health required that ethics be included in education of trainees.

The ecological sciences community may offer a preview of the future. A member of that community said there is a growing interest among her colleagues and their students – she

estimated as many as 10-15% in becoming advocates. In fact, she said, some in that field believe it is their duty to advocate for the environment.

Despite the contrasting views expressed by many workshop participants in answer to these questions, is it a good idea to develop materials for those interested in advocating? Should AAAS consider training in advocacy to be an important part of a scientist's education? Individual scientists may not have a grasp on what their duties as advocates are. Should AAAS take the lead in setting forth guidelines for responsible advocacy?[7]

These unanswered questions drove home the need for further empirical research on advocacy.

Assuming a survey of individual scientists is not feasible and recognizing that individual scientists will differ in their views about whether to engage in advocacy, are the position and mission statements, ethics codes, etc., of scientific societies good surrogate data for what the scientific community has to say about advocacy by scientists? What caveats associated with using such data should be taken into account?

There was a divergence of views on this issue. Codes of conduct for scientists may actually be in conflict with guidelines for advocates, at least in some instances. Nevertheless, some attendees thought that these codes and other kinds of documents might be a good place to start research on advocacy.

How will science communication, advocacy and activism be changed by the world of social media?

Although some attendees thought the new media do not change the advocacy landscape in a marked way, the majority seemed to think otherwise. One participant noted that with the advent of new media, we are losing our "old world" science translators – science journalists – and it is, therefore, more important for the scientific community to step forward to fill this gap. This can be seen as a burden or as an opportunity for fresh and creative thinking among scientists, as they can no longer communicate only with an "inside audience." For some, it is a matter of changing expectations among scientists and the public about the role the former should play in public policy deliberations.

Others noted how new media have changed the role of experts. With so many "science" bloggers, who can we now trust for accurate information and advice? Participants also observed that the advent of new ways of broad communication have contributed to making debates about science/public policy controversies more raucous.

[7] This begs the question of whether AAAS should promote "responsible" advocacy or "effective" advocacy, which may not always be the same thing.

Summing Up

To end, we go back to the report's beginning, where we made several observations that motivated this undertaking: scientists are increasingly being encouraged to become engaged with the public policy process; a subset of scientists is already "doing" advocacy, with varying degrees of skill, enthusiasm, and support; and some younger scientists, including those in graduate school, are expressing increasing interest in how their work will affect the larger society, and are seeking guidance on how best to engage the policy process. We make no claim that this report is a 'how-to manual" for policy advocacy in ways consistent with what it means to be a responsible scientist. Far from it; the terrain is too unsettled to be that confident. Yet, scientists will continue to stretch the boundaries that (re)define their role in public policy debates, a role for which they will garner both praise and criticism. We hope that this report takes us one step closer to defining what a "culture of responsible advocacy by scientists" would look like and what factors, internal and external to science, will need to be explored further in order to foster such an environment. A contemporary view of the social contract between science and society demands nothing less. AAAS is considering ways that it can go beyond this initial effort and invites others to share their ideas with us.