

**DMVEP
Interim Assessment Meeting
April 17-18, 2000
Results and Recommendations**

I. Overview

The Decision Making and Valuation for Environmental Policy grants program (DMVEP) was established to support research that will contribute to the development of practical, credible approaches for estimating the benefits and costs of environmental programs and improving decision making about environmental issues. It is an annual \$2 million extramural awards competition that is managed jointly by the National Science Foundation (NSF) and the U.S. Environmental Protection Agency (EPA).

The Government Performance and Results Act (GPRA) of 1993 requires all federal programs to show how they serve the public and meet agency goals. GPRA focuses on the outcomes and results of government activities. The intent is to develop measures of outcomes that can be tied to annual budget allocations. This report describes the NSF's and EPA's efforts to make the DMVEP program responsive to the spirit and letter of the GPRA.

After five years of program operation (1995-1999), NSF and EPA convened a number of subject matter experts and users of environmental decision making and valuation research to: evaluate the current progress of the DMVEP research grants program; suggest measures for results the program should be achieving; and suggest improvements to the program. (Appendix A contains the names of the participants.) The funding agencies were interested in determining if the DMVEP program is producing useful results and communicating them effectively. Since the DMVEP grants program is only five years old, many of the research projects are under way and have not reported final results, so the evidence on which the experts based their opinion is somewhat limited.

The April 17 and 18, 2000 DMVEP interim assessment generated many ideas for redirecting, improving, and measuring the progress of the program. The experts who participated in the program review commented that the DMVEP program fills a critical research niche that is not addressed by other research programs and commended the program for advancing the state of knowledge in an underfunded area, and helping to develop a new area of study. Among many recommendations they made were that the program (1) increase outreach and communication efforts, to improve awareness both of funding opportunities and of research findings, (2) continue to support research on both monetary and non-monetizable ecosystem valuation, and (3) encourage research on group and institutional - as well as individual - valuation and decision making for environmental policy. Reviewers recommended a range of processes and metrics as ways to achieve these objectives and evaluate success in doing so. Recognizing that calls for increased funding are often of limited value, the reviewers nevertheless concluded that this program should be funded at a higher level. Not all of these recommendations

may be practicable within the program's resource and institutional limitations. As a result, NSF and EPA will have to set priorities among the recommendations.

II. Assessment questions

NSF and EPA approached this interim assessment as an opportunity to examine the contribution of the funded research to the multidisciplinary field of environmental valuation and decision making, discuss appropriate measures for evaluating research programs, and identify potential program improvements. The agencies posed the following questions to guide the reviewers' assessments:

1. **Selecting research topics.** What are the high priority environmental decision making and valuation topics in your field of expertise or areas of interest, and are these areas being addressed? How is this research relevant and useful to you and/or your agency or discipline? How could it be more useful?
2. **Measuring results.** What are reasonable indicators or criteria for measuring the value of the research results stemming from this program? Research value should be relevant for EPA, NSF, and the general public, as well as to academic institutions and the disciplines involved.
3. **Assessing results.** Is this program generating high quality research results? What have been the impacts of the funded research on the sponsoring agencies' missions? What have been the environmental protection, educational and training impacts of the research to date, if any? Has the program influenced curriculum or student/faculty development? How can the sponsoring agencies improve these impacts?
4. **Communicating priorities and results.** Are the priorities in the solicitations and the results of this program being communicated effectively to researchers and practitioners? How can the funding agencies help to more effectively and broadly communicate results?
5. **Improving the program.** The research results can provide continuous feedback to EPA and NSF on the evolving status of research in environmental valuation and decisionmaking, including trends in research topics, methods, findings, and publications. How can this information be used to support ongoing improvements to a high quality and relevant research program?

Participants reformulated these five questions into three:

1. Are DMVEP funded projects addressing important issues? What are the priority gaps that should be addressed by the research?
2. What have been and should be the major impacts of the DMVEP program on:
 - the state of knowledge

- users
 - education and curriculum
3. What improvements are recommended?
- to RFP's
 - to metrics and information that should be collected
 - to the program's communication strategy

III. Reviewer responses

Question 1. Are DMVEP funded projects addressing important issues? What are the priority gaps that should be addressed by the research?

In response to the first part of Question 1, the reviewers (when averaged) gave the program a score of 3 to 3.5 on a scale of 5 (B to B+) for addressing the areas of highest priority in environmental social science research. Reviewers suggested that the program should take a “portfolio” approach to distributing research funding across proposed projects. In this approach, a majority of funded projects would be extensions or practical applications of existing theory or methods. The remainder would be high risk projects with the potential for significant future impacts on environmental social science research and applications. Using this model, some failures are to be expected, as well as some breakthrough accomplishments.

In response to the second part of Question 1, reviewers identified several high priority “core” research areas that should receive continued or increased attention in future DMVEP solicitations, assuming continuation of current funding levels. These include:

- continued research on ecosystem valuation and relevant methods, including ways to incorporate non-monetizable or non-quantifiable ecological information into environmental policy decisions;
- research on linking and contrasting individual environmental values with group or collective valuation of environmental amenities, as well as research on group valuation in general;
- research on aggregate, organizational and institutional environmental decision making and use of environmental information in corporations, government agencies, NGOs and communities; and
- research on the value, effectiveness, costs, impacts and implications of mandatory provision of environmental information, e.g., how people understand and use information provided by businesses (Toxics Release Inventory, etc.), government agencies or other organizations.

The experts identified the need to develop and assess new tools and approaches in these research areas. Should the program receive more resources, and to the extent these areas are not addressed by other research programs, important research extensions would include:

- Consideration of social equity, including environmental justice (regional, ethnic) and inter-generational concerns;
- International concerns, including cross-border effects, environment and trade effects, and multi-national considerations, i.e., environmental decision making of multi-national organizations and corporations.

Reviewers noted that the DMVEP program should concentrate its resources on those of the areas listed above that are not currently supported by other EPA or NSF programs. They expressed concern that some of these areas are at least partly supported by other programs, such as EPA's programs on "Corporate Environmental Performance and Effectiveness of Governmental Interventions," and "Market Mechanisms and Incentives."

Question 2. What have been and should be the major impacts of the DMVEP program on:

- **The state of knowledge**

Participants spoke of accomplishments to date in general terms, based on findings described in the Aspen Interim Assessment report. Prepared as background for the meeting, the report is accessible at www.nsf.gov/home/crssprgm/epa/dmvep.htm. The experts commended EPA and NSF for establishing an important niche program and each agency for accommodating the perspectives of the other. Additionally, they noted the number and diversity of publications that have resulted from the grants, without commenting on either the comparative productivity or value of these outputs. However, many expressed the belief that it is too early to determine definitively what the DMVEP program's impacts have been.

To evaluate the program's state of knowledge impacts in the future, participants suggested surveying some or all of past grant recipients to determine their perspectives of what the program's largest knowledge impacts have been. Additionally, participants suggested that the agencies document workshops, presentations and other appearances or consultations by DMVEP investigators to better understand the scope and reach of the program's influence.

- **Users**

While the public is the ultimate beneficiary of improved environmental decision making, participants identified four primary user groups of DMVEP research: private decision makers, academic researchers, public sector researchers, and public policy makers. Attendees acknowledged that the best way to identify program impacts would be through behavioral changes by these user groups, such as policy alterations resulting from DMVEP-sponsored research. They provided two examples: Scandinavian countries have cited DMVEP research in policy debates, and Finland postponed implementation of an environmental tax policy because of DMVEP research results.

Participants also encouraged the funding agencies to track the use of research results in bibliographies of economic assessments conducted by EPA and other agencies and in environmental court cases.

- **Education and curriculum**

Participants noted some evidence of success in the impacts on education and curriculum, with respect to the number of graduate students supported by grants and changes in the curricula of several institutions. They suggested a system of records be developed and maintained on these matters.

Question 3: What improvements are recommended?

The reviewers made a number of explicit recommendations to improve program focus and process (e.g., tracking results). They also recommended improvements for communication of: needs, availability of support, and research results (publication outlets). Appendix B contains additional comments from one meeting participant.

- Recommendations for improvements in requests for proposals:

1. Rewrite the program announcement to focus on the priority “core” areas identified above.

The reviewers also recommended that the program implement process changes, many of which should be reflected in the new request for proposals:

2. Clarify the connection between DMVEP research results and an improved environment;
3. Create an advisory panel to improve the research design of new awards in the pre-award phase and the dissemination of results;
4. Develop a plan for utilization of research results;
5. Increase the interdisciplinary requirements for a team of researchers;
6. Encourage student support with grant funds.

- Recommendations for improvements to metrics and information collected:

Table 1 summarizes the suggestions made regarding metrics and information that the program should collect.

- Recommendations for improving the program’s communication strategy

1. Expand communication of interesting research questions
2. Encourage and promote communication within an interdisciplinary scientific community

3. Improve communication between researchers and practitioners
4. Hold a pre-research workshop meeting between researchers and users
5. Provide guidance to researchers for disseminating results via the internet
6. Translate research results into simplified terms for use by practitioners

Publication Outlets:

1. Internet (sites for dissemination of working papers, journals)
2. Professional societies
3. Practitioner societies
4. Public administration
5. Collect and publish compilation of stories (results)
6. Institute a “structured” conversation for using research results between users, research administrators and researchers
7. Develop and send out quarterly newsletters (after the RFF “Resources” model)
8. Allow or assist researchers in getting outside support to improve or extend DMVEP funded research

Table 1. A catalog of the most important impacts the program should try to accomplish, as well as proposed measures to indicate the degree of program success, includes:

Impact	Measure
<i>Knowledge</i>	
Increased collaboration; Larger interdisciplinary community of expertise	More interdisciplinary research teams; Greater cross-disciplinary citations
Improved knowledge base for DMVEP	Portfolio approach, products, anecdotes
Better communication of research results	Survey: User recognition of results; Number of and attendance at workshops; Publications; Outreach efforts
<i>Users</i>	
Development of usable information for policy making	Dissemination to relevant constituencies
Useful information for policy making	Citations in economic analyses, guidance, legal developments; Behavioral changes in response to use of research results
Improved policy-making	Identify and survey users about how results were used; Cost-effectiveness of decisions; Use of benefit-to-cost measures (NPV, BC ratio); Degree of program support; Timeliness of products Anecdotes/stories about impacts where no quantitative measures available Improved cost-effectiveness Increased trust/confidence in decisions
Use of a broader range of decision criteria; Involve broader range of expertise in decisions	Record of increased non-monetary values in policy and decision-making
Improved public understanding of decision-making processes	Survey measures of understanding
Improved environmental outcomes	Environmental indicators; trend data
<i>Curriculum/Capacity Building</i>	
Development of new researchers & students; Expansion of subject areas	Number of 1 st time researchers supported; Number of graduate students supported; New collaborative areas for EPA/NSF; No. of multi-disciplinary research projects
Quality researchers in program; Greater number of disciplines	Publications in prestigious journals; Awards; Interdisciplinary publications; Number of disciplines noted

Conclusions

As a capstone to the discussion, reviewers commented that the DMVEP program fills a critical research niche that is not addressed by other research programs, such as NSF or EPA economic research. Panelists commended the program for advancing the state of knowledge in an underfunded area, for modifying the perspectives of both NSF and EPA (finding common ground), and for helping to develop a new area of study and researcher competence. They recommended the program receive increased funding.

The April 17 and 18, 2000 DMVEP interim assessment generated numerous ideas for improving, redirecting or measuring the progress of the program. Not all of the recommendations may be practicable within the program's resource and institutional limitations. As a result, NSF and EPA will have to set priorities among the recommendations.

Program Officer Comments

The program officers at EPA and NSF found this entire exercise and the suggestions of the participants very useful. The new DMVEP program announcement reflects the priorities indicated by meeting members. In addition, the program officers agree with the participants that more interactions among investigators, more emphasis on outreach and dissemination of research results, and better documentation of the scope and reach of the program should have priority. Additionally, capacity building (in the form of training the next generation of researchers) is important.

Appendix A: Decision Making and Valuation for Environmental Policy: Interim Assessment Experts

Meeting Participants

Erik Beck	Economist, USEPA Region 1
Baruch Fischhoff	Professor of Social and Decision Sciences and Engineering and Public Policy, Carnegie Mellon University
William Hooke	Formerly director of the National Oceanic and Atmospheric Administration's U.S. Weather Research Program Office, now senior policy fellow and associate director of the Atmospheric Policy Program at the American Meteorological Society.
Carol Jones	Economist, Research Director, USDA Economic Research Service, - Resource Economics Division
Roger Kasperson	Professor, Clark University; President, Society for Risk Analysis
Robert Lee	Economist – USEPA, Office of Pollution Prevention and Toxic Substances
Alfred Marcus	Professor, University of Minnesota Carlson School of Management
Elizabeth Martin	Senior Researcher for Survey Methodology, US Department of Census
Doug McLean	Professor of Philosophy, University of Maryland, Baltimore County
Paul Portney	President, Resources for the Future

Corresponding Experts

Randy Lutter	Economist, Fellow, American Enterprise Institute – Brookings Institute
Maureen Cropper	Economist, World Bank/ University of Maryland
Lesley McGeorge	Director of Research, New Jersey Department of Environmental Protection

Appendix B: Comments from Interim Assessment Expert Carol Jones

Drafted and submitted: 2 May 2000/24 June 2000

A. Important topics for improving valuation methods that should continue to receive support

1. Methodological development of choice experiments (a stated preference approach):

Among the stated preference portfolio of valuation methods, substantial investments have been made in the development of the single (or 2) scenario approach of “contingent valuation (CV).” The CV framework for eliciting stated preferences has limited flexibility for use in policy analysis – the policy outcomes to be valued has to be well-specified ahead of time.

In contrast are **choice experiments**, a less well-developed stated preference approach, in which survey respondents are given repeated opportunities to choose among alternative policy outcomes in which several variables (attributes) are allowed to vary. Because choice experiments allow the analyst to estimate valuation functions for multiple attributes, it is possible to value a wide range of scenarios with changing levels of attributes, rather than simply 1 or 2 pre-defined scenarios.

- The approach has the potential for several major advantages over the CV framework, including:
 - it facilitates a broader evaluation of the efficient scale of programs, rather than evaluating simple yes/no choices of 1-2 pre-defined scales
 - it facilitates valuing provision of multiple public goods, which is critical when valuing the providing of (alternative) public goods (as opposed to measuring damages to natural resources from an accident)
- At the same time, a variety of methodological issues arise in implementing any stated preference approach, which remain to be evaluated for this approach.

Consequently I believe that it is important to distinguish among different stated preference approaches when making funding recommendations. At this point in time, there is potentially high reward from putting resources toward methodological development of choice experiments. (eg, building on Kanninen’s project).

2. Incentive compatibility (ie, incentives for truth-telling) of alternative formats for stated preference methods

Many of the “biases” that have identified in the literature can be traced to the incentive properties of the survey instrument. The line of work begun by Carson, Grove and Machina is very important, in that it *differentiates* incentive properties among different elicitation formats and provides many testable hypotheses about differing results on CV properties across the literature. I have not seen the final product of their grant, but I think this line of work is extremely promising for high returns: it provides an important

organizing principle for a meta-analysis of the extensive but fragmented stated preference literature and should continue to be funded.

B. Differentiation of priority research between this program and other programs

I think that the EPA and NSF social science research programs may be better positioned to accomplish their goals if the scope of research funded in each is relatively focused, rather than diffuse. For this reason, I am noting here other areas of research that I think should receive high priority – but suggest that they have separate programs to fund them and that proposals in those areas be directed to those, rather than to DMVEPIA.

1. Developing linkages between economic models and environmental models, to value policies to improve environmental outcomes.
 - Linkages need to be made among 3 sets of models:
 - Economic models of private decision-making in response to policies (e.g., farmer management of nutrients in response to TMDLs, with outputs that may include quantity of nutrients transmitted to edge-of-field)
 - Environmental models natural science models that translate the outputs from economic behavior (e.g., quantity of nutrients transmitted to edge-of-field) into quality attributes of natural resources, (such as inland, estuarine water quality) that can feed into:
 - Economic valuation models of the natural resources (based on either value of use of resources, or direct valuation of resources) - these use as inputs the changes in resource quality resulting from policy changes and provide the final link between, say, water quality policy and the value it may provide to the public in improved water quality
 - The Water and Watersheds program is specifically designed to support such interdisciplinary work. Also there are resources allocated to linking climate change science and social science. I think both programs are very important and should get lots of financial support.
2. A variety of proposals were also made to study different kinds of policies – for example, voluntary information provision strategies. I think it is important to direct such research to the funding program, Market-based Mechanisms and other Incentives for Environmental Management

C. Recommendations for improvements

1. Improving input and feedback to researchers - question formation, results
 - Goals:
 - Promote interdisciplinary communication among researchers
 - Promote communication among academic and public sector policy/research communities
 - Methods:
 - Program seminars on topics

- Web-based access to research products through agency web-site portal
- Mentoring role: guidance on how to disseminate working papers to broader policy, inter-disciplinary audiences

2. Program role in providing a service to policy practitioners

Disseminating results beyond the research community – creating written overview materials, web outreach