SAB Science Integration for Decision Making Fact-Finding Meeting
Office of Policy, Economics, and Innovation, National Center for Environmental Economics (NCEE)
Ariel Rios North, Washington, DC
January 21, 2010

Four members of the SAB Committee on Science Integration for Decision Making conducted one interview with EPA's National Center for Environmental Economics (NCEE): Drs. Terry Daniel and Thomas Wallsten in person, and Drs. Catherine Kling and Thomas Theis by telephone. Dr. Vanessa Vu, Director of the SAB Staff Office, provided a brief introduction to the purpose of the interview and the Designated Federal Officer, Dr. Angela Nugent, took notes to develop a summary of the conversation. All interviewees were provided a copy of the committee's Preliminary Study Plan in advance.

Dr. Vu noted that the purpose of the interview was to help SAB Committee members learn about NCEE's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts. Dr. Vu thanked participants for taking time for the interviews.

Meeting with the NCEE Director and Technical Staff (9:15 a.m. - 10:15 a.m.) Participants:

Dr. Albert McGartland, Director
Dr. Charles Griffiths, Economist
Dr. David Evans, Economist,
Dr. Elizabeth Kopits, Economist
Dr. Nathalie Simon, Economist
Mr. Daniel Axelrad, Environmental Scientist

The National Center for Environmental Economics (NCEE) is part of EPA's Office of Policy, Economics, and Innovation. It contains EPA's largest concentration of economists and also includes experts in human health science and ecology. NCEE provides technical economic support to program offices, reviews economic analyses for economically significant rules, and engages in primary research to fill key information gaps for economic analysis. NCEE analysts bring a deep knowledge of risk assessment and an interdisciplinary skill set to benefits analysis. The Center has a strong interest in advancing new and better ways to quantify benefits and costs associated with EPA's regulatory options.

Activities vary depending on Agency priorities, but approximately half of NCEE's time is devoted to regulatory review, primarily to support activities related to climate change and EPA's Office of Air and Radiation. Typically, individual program offices conduct economic analyses independently and then provide those draft analyses to NCEE for review. Ideally, EPA’s program offices would consult with NCEE early in the regulatory process about the design and execution of economic analyses, when the center could be most helpful. Program offices most often reach out to NCEE in the early stages of analytic development when a program office manager is knowledgeable about the need for economic analysis, does not have the in-house capability to perform the analysis and/or encounters a particularly difficult problem (e.g.,

benefits assessments for air toxics). NCEE may also be called in to help when there is a new use for or understanding of the use of economic analysis, for example, as with the April 2009 Supreme Court determination that EPA acted reasonably in weighing the costs and benefits of various technologies when it promulgated regulations for cooling water under Section 316(b) of the Clean Water Act.

NCEE also tries to look across EPA analyses to identify key data and knowledge gaps that can be the focus of research. One example is NCEE's current interest in improving cost analysis, so it will have rigor comparable to EPA's benefits analysis.

Integration across scientific disciplines is essential to research in environmental economics, just as it is essential to any individual economic analysis. Ideally, problem formulation would happen at a high level or systems level before scientific analyses begin, with social scientists, including economists, at the table. Often NCEE economists encounter biologists and chemists who apply standard tools that do not address risk managers' issues or issues of human behavior -- questions of interest for economists. Recently, there has been some increased collaboration between human health scientists and economists in program offices, but regional offices generally do not have regulatory requirements for formal benefit analyses that can help foster such inter-disciplinary collaboration.

Economists bring a different perspective to scientific analysis compared to other EPA scientists and have persisted in raising questions not pursued by EPA risk assessors. One example is non-cancer health effects, such as hypertension effects related to mercury exposure and cardio-vascular impacts of ozone. NCEE suggested including those endpoints in EPA's benefit assessment because information relevant to risk management existed, although they were not included in the final analysis.

It has been difficult to communicate uncertainty to EPA decision-makers and the public. Both groups - and EPA's press office - typically do not want a probability density function and ask instead for an uncertainty range or for a "middle number." A recent report by Resources for the Future (Krupnick, A.J., R.D. Morgenstern, et al. 2006, *Not a sure thing: Making regulatory choices under uncertainty*) contains a useful appendix on communicating uncertainties, but NCEE staff still are seeking new approaches. One interviewee reported that qualitative discussions are generally more successful than quantitative discussion. NCEE is experimenting with graphical representations of uncertainty to communicate the benefits of climate change actions.

Integration of uncertainty information into decision making depends on the political or policy context. If there is a bias against regulatory action, uncertainty information can become an "excuse not to do anything," rather than an acknowledgment of some probability greater than zero. Similarly, economists may be "pushed out of the picture" by managers with a bias towards action, if economists are perceived as "slowing down the regulatory process." SAB members suggested that the scientific process may not fit well with many of EPA's regulatory programs, where there are disincentives to revisit hard-won regulations. Previous recommendations about some aspects of science integration may have ignored this "mismatch." An adaptive management model for integrating science and policy might fit better with EPA programs that

have an iterative component, like the National Ambient Air Quality Standards program, which requires review of criteria air pollutant standards every five years.

In the remaining part of the discussion, NCEE staff discussed science integration related to different kinds of analyses supporting environmental protection.

- Market-based tools are being explored by different parts of EPA (e.g., EPA's Office of Water has a dedicated team of 4-5 people dedicated to offsets and tradable permits), while NCEE has focused on the need to design such tools well and has offered suggestions where it believes market incentives will or will not work well.
- For ecological valuation, NCEE is open to alternatives to monetizing if such approaches would help inform decisions. Wetland indexing and an ecosystem-service approach could help decision makers, for example. NCEE is critical of methods, that rely on metrics that are not based on metrics linked to environmental benefit (damage) or appropriate value. An example of a metric NCEE does not favor is the "emergy concept"
- EPA will need the capability of analyzing trade-offs between potential changes in different kinds of ecological services.

NCEE concluded the discussion by underscoring the importance of stated preference surveys as a mechanism for understanding public preferences and integrating that information into decision making. EPA should conduct and make use of scientifically valid studies of public preferences, independent of politics and changes of Administration. NCEE itself does not generally participate in any other kind of interaction with the public in developing scientific assessments, other than to participate in conferences or public meetings of the Science Advisory Board Environmental Economics Advisory Committee, where many NCEE work products are reviewed.