Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Science Advisory Board (SAB)
Committee on Valuing the Protection of Ecological Systems and Services
Public Teleconference – December 3, 2003

Committee Members: (See Roster – Attachment A)

Date and Time: 1 p.m. to 2:30 p.m., December 3, 2003 (See *Federal Register* Notice - Attachment B)

Location: By Teleconference

Purpose: The purpose of this meeting was to plan the Committee's work. Specifically to (1) raise clarifying questions to better focus themes work and (2) identify cross-cutting issues.

Attendees:

Chair: Dr. Domenico Grasso

SAB Members:
Dr. William Ascher
Dr. Gregory Biddinger
Dr. Ann Bostrom
Dr. James Boyd
Dr. Robert Costanza
Dr. Terry Daniel
Dr. A. Myrick Freeman
Dr. Dennis Grossman
Dr. Robert Huggett
Dr. Klaus Lackner
Dr. Douglas MacLean
Dr. Stephen Polasky
Dr. Paul Risser
Dr. Holmes Rolston
Dr. Mark Sagoff
Dr. Kathleen Segerson
Dr. Paul Slovic
Dr. V. Kerry Smith
Dr. Robert Stavins
Dr. Valerie Thomas
Dr. Barton Thompson, Jr.

SAB Staff:
Dr. Angela Nugent, Designated Federal Officer
Dr. Anthony Maciorowski, Acting Associate Director for Science, SAB Staff Office

Also on the call:

Molly Whitworth, ORD, Linda Chappell, Elizabeth Schwartz, Meg McVay, Katherine von Stackelberg

Meeting Summary

The discussion departed from the Meeting Agenda (See Meeting Agenda - Attachment C) as described below. The teleconference lasted until 2:30 p.m. on October 28, 2003.

Opening of Public Teleconference, Review of Agenda and Materials Sent

Dr. Angela Nugent, Designated Federal Officer (DFO) for the SAB Committee on Valuing the Protection of Ecological Systems and Services, opened the meeting at 1:00 p.m. and took the roll. She summarized the materials sent to the Committee. Dr. Domenico Grasso, Chair of the Committee reviewed the draft agenda and mentioned that he planned to set up a "Steering Group" for the committee.

Discussion of Themes Reports

Dr. Grasso began by thanking Committee members for their work on the six themes developed after the October 28, 2003 Committee meeting. He asked Committee members to limit discussion to clarifying questions in the teleconference call for theme leaders about their 6 theme reports. This approach would leave time, as planned on the agenda, for a general discussion of the themes overall and their relationship to the Committee's planned outcomes and outputs.. Committee members asked, instead, for a different process and requested that theme leaders briefly summarize the theme reports.

Dr. Gregory Biddinger spoke briefly on the process his group used to draft its report on "how context makes a difference" in the kinds of analyses needed. His group identified three three generic types of context: political, ecological, and socio-economic contexts. He noted a possible overlap with the institutional framework theme. Across those sets of contexts, his group noted common elements or "subthemes" of scale (temporal and spatial), organization, and to address uncertainty. The group envisions two deliverables: by January: (1) draft definitions or descriptive texts for contexts and subthemes; and (2) a design of the physical matrix or a table that the group envisions generating. The matrix or table would be used to communicate how different contexts affect method selection. He noted a clear overlap with group 3 and 6.

A Committee member asked whether the matrix would also look how valuation information is used in different settings, e.g., regulatory vs. other settings. A theme group member agreed that was another needed dimension.

Another Committee member asked whether the theme group envisioned looking at cases. The structure of the matrix and category of decision could anticipate the kinds of cases and scenarios that might become available to the broader Committee to study.

Dr. Grasso asked how the planned theme activity related to the overall charge of the Committee and expected outcomes. The theme leader responded that the design of the matrix would be a characterization of Agency needs and appropriate methods for different needs would be mapped to the matrix. He also said that the committee was still wrestling with the difference between the broad overall charge and the charge from Dom that the Committee's work be practical and identify specific expected outcome. Dom asked whether the theme group envisions a protocol or a set of principles to act on and emphasized that the Committee's final report needed to be more than academic; it needs to relate to Agency work and provide advice to assist the Agency. At a minimum, he asked the theme group to consider how the Committee could assess the utility for matrix for Agency's use. Dr. Biddinger responded that if the whole panel agrees with the design of the matrix, it would set the tone and establish a framework for the Committee's report. Another Committee member added that if the cells in matrix could follow operations of Agency processes, it would go towards helping the Agency meet its needs.

Dr. Paul Slovic then presented the report from the group he lead on "Values in a democratic society." He described the teleconference the group held and its thinking to date. He pointed out that values are fundamental to valuing. If we are valuing protection of the environment, the topic is "not far" from risk. There is an opportunity to learn from the attempts to address environmental problems with a risk-based approach. He cited the NAS report, "Understanding Risk," which outlined the importance of process in which science occurs and the importance of involving stakeholders involved in deliberative processes. He saw potential parallels between risk assessment and assessing ecological benefits. He noted that the group had not settled on a proposed approach for pursing the theme. One approach would be to invite in speakers.

The Committee then discussed the theme. One member suggested that the theme group also consider how eco-valuation is different from risk assessment. Another asked whether the theme group envisioned that the Committee would make recommendations on processes to follow when doing these eco valuations. Another member emphasized that the values assumed or decided before scientific analysis may decide the outcomes of those analyses and that it is important to disclose those assumptions or decisions, at a minimum, as part of a public process. Another member asked whether the "object of choice" for the theme group was reductions in different impacts on an ecosystem as consequences of exposure profile or loss of services. Dr. Slovic responded that the theme group envisioned both. Another Committee member pointed out the importance of characterizing the uncertainties involved in how something is valued, just as EPA points out uncertainties in risk characterization.

Members then mentioned additional sources to be considered, along with the NAS "Understanding Risk" Report, so that the Committee could build on those efforts. The EPA "Unfinished Business" and the SAB "Reducing Risk" report were alluded to. Another member mentioned that the Agency's Ecological Risk Framework and Guidelines built on the "Reducing

Risk Report" and built in public involvement in the earliest stage. He also noted that diagrams in the Agency draft strategic plan showed valuation in the middle of the assessment process and at the end—while it should be at the beginning of the process.

The Chair asked whether the Group had considered "metrics" for the success of this theme. Dr. Slovic responded that the group envisioned a framework where science is central, critical, respected, but not run aground on social politics. Another member asked whether the Agency wanted to define protection of ecological systems and services in terms of risks. Once benefit are described, they can be quantified. Prior to that, establishing benefits involves a value judgment, where public opinion comes in. He suggested that the Committee need to identify points in debate where public needs to be involved early. He sees the issue before the committee as not just a technological issue, truly an issue of values. This is true, in his view, even more so than with human health risk assessment, because there is less consensus on what people value.

The Chair asked how the group envisioned addressing the Agency's current approaches to get stakeholder involvement on ecological issues. Does the theme group envision that the Committee would come up with a protocol for public processes for identifying values or evaluate existing processes? One member responded that such an activity was part of the vision: laying out an appropriate process and operationalizing ways to address concerns about value judgments made by a small group.

Another member pointed out that, while the theme is extremely interesting, it may be of limited value to EPA, because of directions already established in existing Executive Orders and regulations, which the Agency cannot change.

Another member responded that the Committee could help the Agency by articulating the interface between democratic process and analysis. A thoughtful analysis of what directions EPA can take would be important and potentially useful. Another member agreed; such guidance could forestall some issues EPA would encounter if these issues were not fully considered.

The Chair asked the theme group to "rephrase the theme" so expected outcomes will be more explicit and the steps involved to developing the theme were made more clear.

Dr. James Boyd then described the third theme, whose core issue was to assess the "pro's and con's" and needs associated with alternative methods. He noted the "real expression of hunger" in the group for some collective learning and assessment of what EPA's needs are and suggested this was a "meta issue" for the whole project. The proposal coming from his theme group was to focus on current practice and look at real people in trenches doing assessments to learn what is working and not working, and the processes and costs involved. The whole panel could learn from this initial focus on practitioners and then make progresses based on what was learned.

Dr. Boyd noted that an issue had arisen in his group concerning whether the Committee should looking at issues EPA is currently working on. He stressed the strong feeling among some members of the group that current cases should not be included. He noted that the DFO had “pushed back” and emphasized the requests from the Agency for guidance on current benefits work. Dr. Angela Nugent, the DFO, stated for the committee that three requests (from EPA’s Office of Water, Office of Air and Radiation, and Region 4) had been received from programs and regions for benefits advice. She understood that it was up to the SAB Staff Office and the Committee to decide about whether and how to take those advisory projects on.

He noted some questions and suggestions made by members of his group regarding the proposed approach. One member asked if the intention was to be focused on learning from past, or to start there and then move on to more prospective issues, based on what the Committee learns learned. Dr. Boyd emphasized that the group had much to learn from discussion of cases because members may be aware of their own sense of “limitations of current practice” but may not be aware of what others see as limitations. Dr. Boyd noted that another group member had suggested making a concrete distinction between methods associated with anthropocentric views and non-anthropocentric views and exploring the methods associated with each.

Several members of the Committee then asked some clarifying questions. One concerned whether biodiversity and ecological services were considered as subjects of cases to be considered. Dr. Boyd responded that the group had not developed an approach for picking cases. Another member noted that the Daily et al. article in Science subscribed to the notion that ecosystems services involved contributions to human well being and accepted monetization as a response. Some others do not subscribe or are uncomfortable with this approach and are searching for other ways to bring ecosystem values (biocentrism, ecosystem health and integrity) into decision-making. He suggested that the Committee needed to address this issue at the outset and pursue implications for measurement and valuation of ecosystems. Another member saw this point as related to the theme involving “values in a democratic society.” Another member asked how the matrix or set of methods would be tested with EPA managers for relevance, as the Committee goes forward.

The Committee then asked the DFO if it was possible for her to develop a list of cases for consideration. Dr. Nugent responded that if the Committee provided guidance as to the criteria for cases of interest and could identify the elements needed to describe the cases, then she could work with contacts in the Agency to provide such a list. One Committee member asked if there was a need for a workshop with presenters, if ecological benefits had been already assessed and documented.

The Committee then focused attention on the issue of undertaking projects linked to current Agency decision or concern. Several members voiced their concern for undertaking such projects. One member pointed out that the Committee was exceptionally diverse and currently lacks consensus. He pointed out that the Committee needed to learn about the range of Agency needs and activities related to valuing the protection of ecological systems and services, and he stated that he was opposed to the committee providing advice in this learning phase. He predicted that advice would not be as scientifically valid as set by the precedent of other SAB advice, and would not be as mature and valid as it would be after the learning period was completed. He expressed fear that early advice on current projects could “greatly damage the credibility of this committee” and stated that it was, in his view, unwise and risky to ask this committee to serve two different functions simultaneously. Two other Committee members agreed. One emphasized that the case-based approach advanced by Dr. Boyd could work well, as long as the Committee does not focus on current, highly publicized choices EPA has to make. Sufficient information exists on past cases so that the Committee can get the information it needs without venturing into controversial and politically charged areas of analysis.

At that point, a Committee member noted that the viewpoints expressed conflicted with the Chair's call for the Committee to be useful. Another Committee member noted that the Committee could handle any associated controversy regarding current cases by being careful about what it wrote and by focusing on the technical problems EPA presents, not policy. In response to a comment that the Committee's early advice might be misused, she noted that advice on "even a cool topic" could be misused." She viewed this situation as "part of the environment" for the SAB. Another member spoke of the opportunity presented for the Committee in identifying data or questions for the Agency to consider, as the Office of Water Designs its planned "Workshop To Determine Research Needs To Support Ecological Benefits Assessment." Having the Agency consider those data and questions in the context of the workshop may be valuable for the Committee's work. Two members of the Committee responded that the controversy associated with at least two of cases to be considered at that workshop made those cases inappropriate for the Committee. He pressed the Committee to consider the consultation.

The Chair asked the Committee to table the discussion and asked the DFO to schedule a teleconference to address the issue before the holidays.

Dr. Mark Sagoff then provided a brief summary of work on the fourth theme "Analytical challenges in linking economic and ecological information." One member committed to providing comments by email. The Chair asked for a statement of the metrics for success and a plan of action to be developed for the theme.

Dr. Dennis Grossman provided a summary of the work on the fifth theme, "express delta value with respect to the nation's ecological assets; national environmental policy and investment." He described this theme as linked to the Committee's overall charge, which aims to define and measure ecological goods and services. This theme group would address this issue at the national scale and address complex issues of aggregation and scale. It will need to work with the "alternative methods" theme group, whose output would be used for assessment of this national-scale analysis. The group is particularly interested in how to integrate non-economic and biological values in the analysis. The sense of the group is that there is a need for multiple methods. One strategy identified is to identify what EPA and others are already doing regarding defining and measuring ecological assets.

Dr. Barton Thompson, Jr., provided a very brief summary of his group's work on the fifth theme, "Institutional framework at EPA to facilitate benefits assessment." Working via email, the group focused on how to identify institutional constraints on EPA assessments of the value of protecting ecological systems and services and whether and how those need to be changed. He saw the theme as linked to the "methods" theme and envisioned that it could be advanced through the practitioners' workshop. Discussion clarified that this theme focused on institutional factors primarily internal to the Agency and did not include external political factors, which would be the domain of the first "contextual" theme group.

Summary

Dr. Grasso asked members to work with the theme leaders to develop further the themes discussed prior to the three teleconference calls planned for January 20, 21, and 22, where they will be discussed in significant detail. He asked members of theme groups to devote special attention to identifying outcomes directed toward assisting the Agency.

He asked the DFO to schedule a teleconference to address the issue of the Committee's taking on selected projects that reflected advisory activities related to projects that are topics of current decision-making or current concern at the Agency.

He committed to providing information about formation of a steering committee, which would work together on design of the final Committee report.

Dr. Grasso thanked Committee members and Agency staff for their participation. The meeting was adjourned at 2:30 p.m.

Respectfully Submitted:

/s/ Angela Nugent
Designated Federal Officer

Certified as True:

/s/ Domenico Grasso
Chair

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by the Panel members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters, or reports prepared and transmitted to the EPA Administrator following the public meetings.

Attachments

Attachment A	Roster
Attachment B	Federal Register Notice
Attachment C	Meeting Agenda
Attachment D	Theme Group Reports

Attachment A: Roster

U.S. Environmental Protection Agency
Science Advisory Board
Committee on Valuing the Protection of Ecological Systems and Services

CHAIR

Dr. Domenico Grasso, Rosemary Bradford Hewlett Professor and Chair, Picker Engineering Program, Smith College, Northampton, MA

Also Member: Executive Committee
Environmental Engineering Committee

SAB MEMBERS

Dr. William Louis Ascher, Dean of the Faculty, Bauer Center, Claremont McKenna College, Claremont, CA

Dr. Gregory Biddinger, Environmental Sciences Advisor, Exxon Mobil Refining and Supply Company, Fairfax, VA

Also Member: Ecological Processes and Effects Committee

Dr. Ann Bostrom, Associate Professor, School of Public Policy, Georgia Institute of Technology, Atlanta, GA

Dr. James Boyd, Senior Fellow, Director, Energy & Natural Resources Division, Resources for the Future, Washington, DC

Dr. Robert Costanza, Professor/Director, Gund Institute for Ecological Economics, School of Natural Resources, University of Vermont, Burlington, VT

Dr. Terry Daniel, Professor of Psychology and Natural Resources, Department of Psychology, Environmental Perception Laboratory, University of Arizona, Tucson, AZ

Dr. A. Myrick Freeman, Research Professor of Economics, Department of Economics, Bowdoin College, Brunswick, ME

Dr. Dennis Grossman, Vice President for Science, Science Division, NatureServe, Arlington, VA

Dr. Geoffrey Heal, Paul Garrett Professor of Public Policy and Business Responsibility , Columbia Business School, Columbia University, New York, NY

Dr. Robert Huggett, Vice President for Research and Graduate Studies, Office of Vice President for Research and Graduate Studies, Michigan State University, East Lansing, MI

Dr. Klaus Lackner, Ewing Worzel Professor of Geophysics, Earth and Environmental Engineering, Columbia University, New York, NY

Dr. Douglas E. MacLean, Professor, Department of Philosophy, University of North Carolina, Chapel Hill, NC

Dr. Harold Mooney, Paul S. Achilles Professor of Environmental Biology, Department of Biological Sciences, Stanford University, Stanford, CA

Dr. Richard Norgaard, Professor of Energy and Resources, Energy and Resources Program, Agricultural and Resource Economics, University of California at Berkeley, Berkeley, CA

Also Member: Environmental Economics Advisory Committee

Dr. Louis F. Pitelka, Director and Professor, Appalachian Laboratory, University of Maryland Center for Environmental Science, Frostburg, MD

Dr. Stephen Polasky, Fesler-Lampert Professor of Ecological/Environmental Economics, Department of Applied Economics, University of Minnesota, St. Paul, MN

Also Member: Environmental Economics Advisory Committee

Dr. Paul G. Risser, Chancellor, Oklahoma State Regents for Higher Education, Oklahoma City, OK

Dr. Holmes Rolston, University Distinguished Professor, Department of Philosophy, Colorado State University, Fort Collins, CO

Dr. Joan Roughgarden, Professor, Biological Sciences and Evolutionary Biology , Stanford University, Stanford, CA

Dr. Mark Sagoff, Senior Research Scholar, Institute for Philosophy and Public Policy, School of Public Affairs, University of Maryland, College Park, MD

Dr. Kathleen Segerson, Professor, Department of Economics, University of Connecticut, Storrs, CT

Also Member: Environmental Economics Advisory Committee

Dr. Paul Slovic, Professor, Department of Psychology, Decision Research, Eugene, OR

Dr. V. Kerry Smith, University Distinguished Professor, Department of Agricultural and Resource Economics, College of Agriculture and Life Sciences, North Carolina State University, Raleigh, NC

Also Member: Advisory Council on Clean Air Compliance Analysis

Dr. Robert Stavins, Albert Pratt Professor of Business and Government, Environment and Natural Resources Program, John F. Kennedy School of Government, Harvard University, Cambridge, MA

Also Member: Environmental Economics Advisory Committee

Dr. Valerie Thomas, Research Scientist, Princeton Environmental Institute, Princeton University, Princeton, NJ

Also Member: Environmental Engineering Committee

Dr. Barton H. (Buzz) Thompson, Jr., Robert E. Paradise Professor of Natural Resources Law and Vice Dean , Stanford Law School, Stanford University, Stanford, CA

SCIENCE ADVISORY BOARD STAFF

Dr. Angela Nugent, Designated Federal Officer, 1200 Pennsylvania Avenue, NW, Washington, DC, Phone: 202-564-4562, Fax: 202-501-0323, (nugent.angela@epa.gov)

Attachment B: Federal Register Notice
Science Advisory Board Staff Office; Notification of Multiple Upcoming Meetings

[Federal Register: November 25, 2003 (Volume 68, Number 227)]
[Notices]
[Page 66095-66096]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr25no03-67]

ENVIRONMENTAL PROTECTION AGENCY
[FRL-7591-6]

Science Advisory Board Staff Office; Notification of Multiple Upcoming Meetings

AGENCY: Environmental Protection Agency (EPA).
ACTION: Notice.

SUMMARY: The EPA Science Advisory Board (SAB) Staff Office announces upcoming multiple meetings of the:

(1) SAB Drinking Water Committee: Face to face meeting.

(2) SAB Cross-Agency Science and Technology Budget Review: Face to face meeting.

(3) Joint meeting of the SAB Environmental Health Committee, and the Integrated Health and Exposure Committee: Face to Face Meeting.

(4) The Advisory Council on Clean Air Compliance Analysis Special Council Panel for the Review of the Third 812 Analysis (Council Special Panel): Public teleconferences.

(5) The SAB Committee on Valuing the Protection of Ecological Systems and Services: Public teleconference.

DATES: December 3, 2003: The SAB Committee on Valuing the Protection of Ecological Systems and Services will hold a public teleconference from 1 p.m. to 2:30 p.m. (EST).

December 10, 2003: The SAB Drinking Water Committee will hold a face-to-face meeting from 9 a.m.. to 12:30 p.m. (EST).

December 10, 2003: The first of a series of public face-to-face meetings of the SAB Cross-Agency Science and Technology Budget Review will be held from 12:30 p.m. to 5:30 p.m. (EST).

December 12, 2003: A joint public face-to-face meeting of the SAB Environmental Health Committee, and the Integrated Health and Exposure

Committee will be held from 9 a.m.. to 12:30 p.m. (EST).

December 19, 2003 and December 22, 2003: The Advisory Council on Clean Air Compliance Analysis Special Council Panel for the Review of the Third 812 Analysis (Council Special Panel) will hold a public teleconference from 12 p.m. to 2 p.m. (EST) both days.

ADDRESSES: Face to Face Meetings: The meeting location for the face to face meetings of the SAB Drinking Water Committee, SAB Cross-Agency Science and Technology Budget Review, SAB Environmental Health Committee, and the Integrated Health and Exposure Committee, is the Washington, DC. Metropolitan area. The specific meeting locations and agendas will be announced on the SAB Web site, http://www.epa.gov/sab ten calendar days prior to the meetings.

Public teleconferences: Participation in the teleconference meetings will be by teleconference only. The agendas will be announced on the SAB Web site, http://www.epa.gov/sab ten calendar days prior to the teleconferences.

FOR FURTHER INFORMATION CONTACT: To reach a central number at the EPA SAB Staff Office, please call via telephone (202) 564-4533, U.S. EPA Science Advisory Board (1400A), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. General information about the SAB can be found in the SAB Web site at http://www.epa.gov/sab.

Members of the public who wish to obtain the call in number and access code to participate in the teleconferences of the Council Special Panel, or the SAB Committee on Valuing the Protection of Ecological Systems, may contact Dr. Angela Nugent, Designated Federal Officer (DFO), via telephone, (202) 564-4562; or via e-mail at nugent.angela@epa.gov.

Any member of the public wishing further information regarding the face to face meetings of the SAB Drinking Water Committee, please contact Dr. James N. Rowe, DFO, via telephone (202) 564-6488; or via e-mail at rowe.james@epa.gov. For information regarding the SAB Cross-Agency Science and Technology Budget Review, please contact Mr. Thomas Miller, DFO, via telephone, (202) 564-4558; or via e-mail at miller.tom@epa.gov. For information regarding the SAB Environmental Health Committee, and the Integrated Health and Exposure Committee, please contact Dr. Suhair Shallal, DFO, via telephone (202) 564-4566; or via e-mail at shallal.suhair@epa.gov.

SUPPLEMENTARY INFORMATION:

Drinking Water Committee

The SAB Drinking Water Committee will be meeting with the Office of

Water (OW) and the Office of Research and Development (ORD) on December 10, 2003, to receive informational briefings. OW will make presentations on (1) their overall process for implementing the regulatory and risk assessment program for the Safe Drinking Water Act (SDWA), and (2) discussion of the intersection between the Clean Water Act (CWA) and SDWA with regards to preserving and restoring drinking water sources. An overview of ORD's Multi-Year Plan (MYP) for drinking water research will be presented. The briefings will set the stage for a formal review of the Drinking Water MYP and consultations on CWA/SDWA interactions on drinking water sources during the spring and summer of FY 2004.

Science Advisory Board Cross-Agency Science and Technology Budget Review

The Board of the SAB will review EPA's cross agency science and technology budget for 2005.

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Collectively, Board members have broad expertise in all aspects of environmental sciences and their expertise is appropriate to addressing EPA's charge. Further, these SAB members have been appointed by the Administrator, to provide advice on broad issues of research planning, budgeting, and management as well as a variety of specific scientific and technical issues.

The Board will hold a series of meetings that will be used to receive briefings on the content of EPA's science and technology programs across the Agency and to review the EPA FY 2005 science and technology budget itself. The briefing meetings will begin on December 10, 2003, and continue into January 2004. During February, the SAB will meet and deliberate on the Agency's FY 2005 science and technology budget. Some meetings will be conducted as face to face meetings of the participants while others will be conducted by telephone conference. All meetings will be open to the public, however, seating is limited and available on a first come basis.

The purpose of this meeting is to: (1) Receive presentations from EPA representatives on the science and technology programs conducted in support of two of EPA's strategic Goal areas, Goal 1 (Clean Air and Global Climate Change) and Goal 2 (Clean and Safe Water), (2) to discuss these programs with Agency representatives and to clarify specific points of interest raised by the Panelists; (3) to make and discuss Panel assignments for the review; and (4) to receive public comments if any are offered.

At a face to face meeting in February 2004, the Board will review the science and technology components of the EPA Fiscal Year 2005 Budget Request and prepare a report to the EPA Administrator on their findings and recommendations.

Environmental Health Committee, and the Integrated Human Exposure Committee

The Environmental Health Committee, and the Integrated Human Exposure Committee will hold a joint meeting to receive informational briefings from various offices within EPA concerning ongoing initiatives for improving risk assessment methodologies. This information will serve as background for upcoming reviews that Environmental Health Committee and the Integrated Human Exposure Committee will participate in during FY 2004.

The Advisory Council on Clean Air Compliance Analysis Special Council Panel for the Review of the Third 812 Analysis (Council Special Panel)

The Council Special Panel will hold a public teleconference call, as described above, to advise the Agency on its plan to develop the third in a series of statutorily mandated comprehensive analyses of the total costs and benefits of programs implemented pursuant to the Clean Air Act. Background on the Council Special Panel and this advisory project was provided in a Federal Register notice published on February 14, 2003 (68 FR 7531-7534).

The public teleconference on December 19, 2003, described above, is planned for the Council Special Panel to review and act on a draft report entitled ``Advisory on Plans for Health Effects Analysis in the Analytical Plan for EPA's Second Prospective Analysis--Benefits and Costs of the Clean Air Act, 1990-2020,'' developed by the Council's Health Effects Subcommittee.

The public teleconference on December 22, 2003, described above, is planned for the Council Special Panel to review and act on a draft report finalizing an Advisory related to the Council Special Panel's review of the Revised Analytical Plan for EPA's Second Prospective Analysis.

Both draft reports identified above will be posted on the SAB Web site as a draft report (consult the following page: http://www.epa.gov/science1/drrep.htm).

SAB Committee on Valuing the Protection of Ecological Systems and Services

The SAB Committee on Valuing the Protection of Ecological Systems and Services will hold a public meeting, as described above, to plan its future work, including a public advisory meeting tentatively planned for January 20-22, 2004.

Background on the Committee and its charge was provided in a Federal Register notice published on March 7, 2003 (68 FR 11082-11084). The overall charge to the Committee is to assess Agency needs and the state of the art and science of valuing protection of ecological systems and services, and then to identify key areas for improving knowledge, methodologies, practice, and research.

Procedures for Providing Public Comment. It is the policy of the EPA SAB Staff Office to accept written public comments of any length, and to accommodate oral public comments whenever possible. The EPA SAB Staff Office expects that public statements presented at the meetings described above will not be repetitive of previously submitted oral or written statements. Oral Comments: In general, each individual or group requesting an oral presentation at a face to face meeting will be limited to a total time of ten minutes (unless otherwise indicated). For teleconference meetings, opportunities for oral comment will usually be limited to no more than three minutes per speaker and no more than fifteen minutes total. Interested parties should contact the DFO in writing (e-mail, fax or mail) at least one week prior to the meeting in order to be placed on the public speaker list for the meeting. Speakers should bring at least 35 copies of their comments and presentation slides for distribution to the participants and public at the meeting. Written Comments: Although written comments are accepted until the date of the meeting (unless otherwise stated), written comments should be received in the SAB Staff Office at least one week prior to the meeting date so that the comments may be made available to the committee for their consideration. Comments should be supplied to the DFO at the address/contact information noted above in the following formats: One hard copy with original signature, and one electronic copy via e-mail (acceptable file format: Adobe Acrobat, WordPerfect, Word, or Rich Text files (in IBM-PC/Windows 95/98 format)). Those providing written comments and who attend the meeting are also asked to bring 35 copies of their comments for public distribution.

Meeting Accommodations: Individuals requiring special accommodation to access these meetings, should contact the SAB Staff Office, at least five business days prior to the meeting so that appropriate arrangements can be made. Meeting space is limited and on a first-come first-served basis.

Dated: November 20, 2003.

Anthony F. Maciorowski,

Acting Associate Director, EPA Science Advisory Board Staff Office.

[FR Doc. 03-29431 Filed 11-24-03; 8:45 am]

BILLING CODE 6560-50-P

Attachment C: Agenda

EPA Science Advisory Board
Committee on Valuing the Protection of Ecological Systems and Services
Advisory Meeting
Teleconference, December 3, 2004, 1-2:30 p.m. Eastern Time

Purpose: To plan the Committee's work. Specifically to (1) raise clarifying questions to better focus themes work and (2) identify cross-cutting issues.

Draft Agenda – December 3, 2003

1:00-1:10	Opening of Teleconference Roll Call Review of Agenda and Materials Sent	Dr. Angela Nugent, Designated Federal Officer, EPA Dr. Domenico Grasso, Chair
1:10-1:40	Clarifying Questions for Each Theme Group leader (5 minutes per group)	Committee Members and Theme Group Leader (identified below) coordinating responses
	1) Purpose/contextual influences	Dr. Gregory Biddinger
	2) Values in a democratic society	Dr. Paul Slovic
	3) Alternative approaches/methods	Dr. James Boyd
	4) Analytical challenges in linking economic and ecological information	Dr. Mark Sagoff
	5) Express delta value with respect to the nation's ecological assets; national environmental policy and investment.	Dr. Dennis Grossman
	6) Institutional framework at EPA to facilitate benefits assessment	Dr. Barton H. Thompson
1:40-2:10	Discussion of Themes in Light of Committee's Overall Charge and Desired Outcomes, Outputs and Long Term Objectives	Committee
2:10-2:25	Proposed Plan to Follow Up on Theme Group Work and Agency Requests	Dr. Domenico Grasso and Committee
2:25-2:30	Summary	Dr. Domenico Grasso
2:30	Adjourn	

Attachment D. Theme Group Reports

- # Theme Group Reports

1:- Contextual Influences

a. Members of the Theme Group -

- Bill Ascher william.ascher@claremontmckenna.edu
- Greg Biddinger gregory.r.bidinger@exxonmobil.com
- Bob Costanza rcostanz@zoo.uvm.edu
- Geoffrey Heal gmh1@columbia.edu
- Klaus Lackner kl2010@columbia.edu
- Kathy Segerson segerson@uconn.edu
- Buzz Thompson, Jr. buzzt@stanford.edu

b. Definitions of Any Major Terms discussed and defined by the Theme Group.

So far the team has recognized that there are at least 3 broad contextual categories that need to be explored further, these include (1) Political, (2) Ecological and (3) Socio-Economic. The team is currently tasked to develop a description of these categories by December 12, 2003.

c. Consideration of the theme as originally defined and a description of the scope as originally proposed or suggested revisions (with supporting arguments).

There really wasn't a definition for this theme just a recognition that the context in which the agency operates may influence the approach taken to assess benefits. It was suggested, methods to test the benefits of a regulation, a policy or a derivative action taken by one of its program or regional offices, might need to rely on different assessment methods.

As discussed in its initial conference call the team members attending agreed with this premise and committed to explore how the contexts may affect methods selection. To that extent the group thought that they would start by trying to assemble a matrix of (1) decision type, (2) Context and (3) assessment design and execution. Their goal is to assemble a first draft of this matrix prior to the January 20/21, 2004 panel meeting.

d. Identification of related major sub-themes.

A number of sub-themes, which cut across the 3 identified contextual categories, were identified. It was suggested that there would be issues of scale in any contextual setting. Temporal, spatial and even social or organizational scales at which the agency and its associated rules and actions are operating should be discussed. As well, the sub-theme of uncertainty was identified for further exploration.

e. Description of how the theme relates to the overall Committee charge and to other themes.

The Charge as initially stated included three major components:
1. Assess the Agency's needs
2. Assess the state of the art and science of valuing protection of ecological systems and services, and

3. Identify key areas for improving knowledge, methodologies, practice, and research.

The focus of the contextual influences theme relates to the overall charge in a number of ways. First, In order to fully assess the agencies needs you have to explore where in the agency's programs and process there is the demand for benefits assessment and/or where there is the potential to add value by it's application. Second, it is essential to understand how leading experts are considering context in the design and execution of benefits assessments to assess the state of the art for benefits assessment. Finally, improving our understanding of the context in which the agency operates and the related scale and uncertainty associated with those operations will be necessary to provide valuable recommendations for improving the agencies practice of benefits assessments.

Regarding other themes we recognized the potential for some overlap. For example we need to coordinate with the theme group focused on influence of scale on methods selection. It is likely that the level of detail will be the basis for differentiation. We will likely discuss generally and they may discuss the particular strength and weaknesses of various methods under specific aspects of scale. It is also possible that our matrix approach to assessing the linkage between context and assessment design could be a general backdrop from which other theme groups might build. This will remain to be seen once we have developed the matrix and gotten broader review by the panel. Our hope is that a partial draft of the matrix will be available for the January panel meeting.

f. Metrics of success for the Committee's work on the theme or a process for establishing those metrics

The group has not discussed this issue to date.

g. Suggestion briefings, consultations, investigations or other activities for the Committee's work related to the themes.

The group has only briefly discussed this issue to date and so far has not identified any briefings, consultations, investigations or other activities. As we proceed this will be considered.

2. Values and Process in a Democratic Society: Lessons Learned from the Risk-Assessment Battlefield

Group: Paul Slovic, Ann Bostrom, Bob Constanza, Terry Daniel, Klaus Lackner, Doug McLean, Dick Norgaard

Quantitative risk assessment came on the scene in the early 1980's amid a wave of optimism about its potential for resolving conflicts and imparting rationality to risk management decision making. The 1983 report "Risk Assessment in the Federal Government: Managing the Process" stands as one of the most widely read and influential documents ever produced by the National Academy of Sciences / National Research Council. The EPA, under William Ruckelshaus' leadership, quickly embraced this methodology as a guide to environmental protection decisions.

Two decades later, risk assessment has proven its value as an important methodology for decision making. But, however useful it has become for some decisions, it has certainly not quelled conflict, controversy, and litigation for the class of decisions where multiple stakeholders hold strong and differing views about what should be done.

In the mid-1990's the Academy revisited the "risk characterization" component of the 1983 report and produced a report "Understanding Risk" Informing Decisions in a Democratic Society" that recognized the need to attend to what might be termed "the sociopolitics of risk" as well as to the science of risk assessment.

In particular, the Understanding Risk report emphasized the need for an iterative process, incorporating both analysis and deliberation, and consulting interested and affected parties right from the beginning. Recognizing that risk assessment is inherently judgmental and dependent upon assumptions and social values, the process of assessment was seen to be as important as the science. Enhanced public participation was deemed necessary to make decision making more democratic, improve the relevance and quality of the technical analysis, and increase the legitimacy and public acceptance of the resulting decisions.

The task of valuing the protection of ecological systems and services seems, in many ways, similar to the task of assessing risk to the environment. To the extent that this is correct, ecological valuation will run into many of the same problems faced by risk assessment during the past two decades. It behooves our committee to examine the lessons learned from risk assessment as a guide to making the valuation process better able to serve the needs of decision makers and society.

Exactly how to distill and apply the lessons from risk assessment remains to be determined. Certainly there are important students and players of "the risk game" who could meet with us; people like Warner North, Tom Burke, Peter Defur, Mark Harwell, Baruch Fischhoff, Sheila Jasanoff, and Kristen Shrader-Frechette come to mind. Values are central to the assessment process and thus, environmental philosophers and nature writers may have important views to offer our committee. Other directions to pursue will likely emerge from discussions of this theme.

3. Alternative approaches/methods for valuing ecological system, services and outcomes? What can be quantified, what can be monetized? Decision-specific approaches. Alternative technological solutions.

Group: Jim Boyd, Bill Ascher; Ann Bostrom; Bob Costanza; Rick Freeman; Klaus Lackner; Hal Mooney; Dick Norgaard; Holmes Rolston; Kerry Smith; Rob Stavins; Valerie Thomas;

Discussion
It was agreed that earlier draft memos would be superseded in all respects by this one.
Following a conference call (Rolston, Ascher, Bostrom, Smith, Stavins, Thomas, Boyd, Nugent) the group makes the following suggestions. (Other members of the theme group are Costanza, Risser, Freeman, Lackner, Norgaard.)

• To address the issues raised by benefit assessment practices (issues both conceptual and methodological) the panel should initially focus on tangible, concrete examples.

• The group also suggests that the examples chosen exclude valuation exercises associated with currently ongoing EPA policy decisions and rulemakings.

• The group would like to hear from practitioners who have completed studies involving benefit assessment.

• As a starting point, we suggest a practitioners' workshop where a variety of practitioners present the methods used in and results of their benefit assessments. Practitioners would be drawn from consulting firms who often conduct the studies, EPA practitioners, and others. The idea is to get a quick crash course on benefit assessment from the people actually doing it.

• The goal of the workshop would be to gain more concrete insight into the methods used; the assumptions made; and the data employed. We also seek frank input from the practitioners regarding the challenges associated with conducting such studies and any limitations of the studies they feel are particularly relevant.

• This workshop will allow the Panel to more explicitly address the following types of questions – among others. What was monetized vs. what was merely quantified? Could things have been monetized or quantified that were not? If so, how? How were economic principles and ecological analysis brought together? How and to what degree is uncertainty captured in the assessment? Are there significant missing elements from the analyses and how might they be addressed? How are the assumptions of the analysis communicated?

• In the meantime, we would like SAB staff to generate a list of potential case studies from which the entire Panel would select. By cases, we mean detailed, directed presentations of and dialogue regarding methods used by the EPA and other agencies. We will make the selection of in-depth cases following the practitioners workshop.

• The following elements of case selection were discussed. Two initial cases in what we could call "Phase I." First, a case that has come fully to closure where monetary estimation of benefits was employed to at least some degree. Second, to address the concern that we not "only go where the easy problems are," we select a case that is likely to be addressed in the future by the EPA, and one that has different – and perhaps particularly challenging – characteristics.

• The cases would involve detailed presentation by agency staff, with the presentations guided by a specific set of questions developed by the Panel.

• Our analysis of cases is not to be limited to these two. But our thought is that we proceed in a phased way, so that the choice of additional cases (Phase II) can be made conditional on what we have learned in the earlier phases.

4. Analytical challenges in linking economic and ecological information"

This is the "Eco-Eco" Theme - the group that examines the problems and prospects of collaboration between economists and ecologists in assessing ecosystems services and related environmental assets. The group will consider reasons, examples, and arguments ecologists and others present for the view that human activities that alter ecosystems can damage economically valuable services these systems provide.

a. Members of the Theme Group

The members of the group include: Terry Daniel, Rick Freeman, Geoffrey Heal, Richard Norgaard, and Mark Sagoff (group leader).

b. Definitions of Any Major Terms Discussed and Defined by the Theme Group

Like the other groups, this team acknowledges that many conceptual difficulties surround the concept of value or valuation. For example, the group acknowledges that people appreciate, care about, or attach value to objects for many different reasons. Some of these reasons are directed to the properties of the objects per se; these are intrinsic values. Other reasons have to do with the effect of objects on welfare or well-being. These are instrumental values. Presumably, we will be considering instrumental values - since the concept of an ecosystem "service" implies that the ecosystem is valued for its outcomes on human welfare not for its intrinsic properties.

There is a background expectation that the values we will be studying are of the sort that cost-benefit analysis can handle. Since cost-benefit analysis allocates goods at market prices, we might be able to finesse disagreements that loom (between ecologists and economists) about valuation in some larger sense. Prices are often observable; methods to infer them when they are not are fairly well understood. Perhaps we do not have to spend too much effort figuring out the philosophical dimensions of valuation if we stick to a notion of "price" as "value in exchange" i.e., a function of supply and demand.

The group, in its initial phone conversation, observed that economists would like ecologists to provide "production function" or its reverse, a "damage function," that relates changes in a given ecosystem to changes that have an economic dimension. Geoffrey Heal mentioned that different ecosystems provide different services and may do so differently; hence the "production function" is likely to proceed case-by-case with each system having idiosyncratic qualities. (Whether there are similarities which permit "benefit transfers" remained an open question.) He and the others on the phone call agreed that some instructive or salient case studies would be most helpful - a conclusion that we understand other groups have reached as well.

One problem may be that the easiest examples are already well-known; e.g., farmers have to buy pollination services from commercial bee keepers if nature does not provide such services free of charge. Accordingly, changes to ecosystems (by pesticides, for example) that harm wild pollinators could require farmers to pay for the commercial system. This is an excellent example of a market-based analysis of the economic value of an ecological service. We would need a variety of these examples to get some traction on the idea of ecosystem services. Only then could we see if these examples lead to general conclusions, concepts, or principles.

Finally, the participants on the phone call recognized the difficulty of saying what is meant by "ecosystem services" other than by giving a list of examples best elaborated in case studies. Perhaps we could start with clear and well-documented examples and go from there. Hunter-and-gatherer goods, such as "capture" fisheries, offer the most obvious examples of ecosystem services, insofar as natural productive processes - as distinct from technology-based agriculture, silviculture, or aquaculture - do the work. Terry Daniel and others on the call discussed the possibility that natural processes are "intrinsically" more desirable than technological ones - e.g., people may spend ten times as much to catch a fish (even to throw back) than to buy one. This is a fascinating point; it should not be lost.

c. Consideration of the theme as originally defined and a description of the scope as originally proposed or suggested revisions (with supporting arguments).

The participants on the phone call recognized the risk that the various groups would coalesce around a few major problems, such as the need for exemplary case studies and the problem of defining "valuation." There may be some interest, then, in focusing the group on the "eco-eco" divide and figuring out how to bridge it. It may be hard to avoid the larger issues, however, since ecologists and economists may divide precisely because they view them differently. Rick Freeman (by e-mail) made the very helpful suggestion that we start with the writing and thoughts of those ecologists (e.g., Daily et al. in the Science essay cited on our web page) who are most keen on attaching economic values to ecosystem services. What examples do they offer and do these illustrate the kind of "damage" or "production" function economists are familiar with?

d. Identification of related major sub-themes

Sub-themes include: what are ecosystem services? How to ecologists and economists differ in their conception of value and can they finesse this difference? What is meant by the "production" or "damage" functions economists seek from ecologists? When natural and technological processes can provide the same good, e.g., trees or fish, there is a strong social preference for the natural process. Why is this? What does it suggest?

e. Description of how the theme relates to the overall Committee charge and to other themes

There is some concern that the themes addressed by the various committees will all overlap and blur together.

f. Metrics of success for the Committee's work on the theme or a process for establishing those metrics

If we could get a representative group to agree on something substantive - not just bromides and cliches - that would be good.

g. Suggestion briefings, consultations, investigations or other activities for the Committee's work related to the themes.

We need to talk again after the group leader and others who wish to do so circulate materials.

5. Express "delta value" with respect to the nation's ecological assets; national environmental policy and investment

Theme Report – Conference Call #1
November 20, 2003

Participants
Dennis Grossman
Joan Roughgarden
Lou Pitelka
Valerie Thomas
Steve Polasky
Angela Nugent

Initial Description of "Theme Charter"

Express value of delta due to EPA's action with respect to nation's ecological assets. Need to say something about national environmental policy and investment.

Team Discussion regarding "Theme Charter" (Summary)

- We need to make the results of this team applicable to the agency, to help them do their work better, rather than generate an academic report that does not provide direct guidance to address EPA program objectives.

- This team should address "big-picture" assessment of the national environment, focusing on top-down valuation of ecosystem services at a national level.
    - Do we have a function/role regarding the EPA Report on the Environment relative to ecosystem status and health?
    - We should identify a few approaches to the big picture valuation of ecosystems, as we can list ecosystems and their benefits, but do not know how to put a value on these benefits and functions (goods and services). Perhaps these services can be bundled for valuation purposes.
    - This team should attempt to put value on nature, green accounting, as if nature was treated as a natural industrial sector with capitalized value.
    - This will necessitate evaluation of what EPA currently does relative the to valuation of ecosystems.

- We should look at the effect of EPA policy change on ecosystem state and function and relate that to change in ecosystem "value".
    - The focus is on ecological production function.
    - This would entail the evaluation of EPA's current contribution to the nation's ecological assets, and an assessment of the agency's contribution to environmental protection.

6. **"Institutional Framework" Theme**

a. Group Members

- Ann Bostrom ann.bostrom@pubpolicy.gatech.edu
- Bob Huggett rhuggett@msu.edu
- Dick Norgaard norgaard@igc.org
- Rob Stavins robert_stavins@harvard.edu
- Buzz Thompson buzzt@stanford.edu

b. Theme Statement & Definitions

The committee did not spend very much time at the October meeting discussing this theme, and the description of the theme in the grid is very sketchy and vague. Our Theme Group has identified two major questions that we plan to address: What institutional factors are likely to influence EPA's ability to effectively value the protection of ecological systems and services? What institutional steps could and should be taken to facilitate the assessment of such protection?

The "institutional factors" that we believe deserve consideration include the following:

- External limitations or restrictions on EPA, including legal requirements and directives (e.g., separation of laws by environmental media, OMB directives, time limitations in completing assessments)
- Internal EPA policies and rules regarding assessments
- EPA's organizational structure, including:
  - Division of responsibilities among various program and policy offices
  - Division of responsibilities between HQ and regional offices
  - Differences in spatial responsibilities and outlook
  - Assignment of specific responsibilities for benefit assessments
- EPA staffing, including:
  - Division of economists, ecologists, and other relevant experts among relevant offices
  - Interaction of economists, ecologists, and other relevant experts
- Resource availability, including:
  - Funding
  - Personnel
- Role of outside consultants in preparing or contributing to assessments (reflecting fact that great bulk of RIA assessments are currently prepared by outside consultants)
- Epistemic communities and their influence on EPA experts/work
- Organizational willingness/ability to adopt new approaches
- Agency ability to obtain relevant data
- Cross-agency relationships

c. Identification of Major Sub-Themes

- **Existing Assessments Within EPA:** How are current benefit assessments conducted? What personnel both inside and outside EPA are involved? What resources are used? To what degree and by what institutional factors is the scope of current assessments constrained? What are the legal and policy restrictions, if any, on what gets valued? Are current assessment approaches "state of the art" and, to the degree they are not, are there institutional explanations?

- **Interdisciplinary Interactions:** What is the current interaction of economists, ecologists, and other relevant experts within EPA, both in conducting assessments and in other related work? What opportunities exist for greater collaborative work and learning? How could interactions among experts be improved?

- **Institutional Factors Affecting Ecosystem Assessments:** To what extent do institutional factors currently impede or facilitate the integrated assessment of ecosystem goods and services? What aspects of ecosystem assessments may lead to additional institutional impediments not present in other assessments (e.g., do they involve a different spatial focus than traditional environmental assessments within EPA, do they require greater time or expert coordination, do they require a longer-term, adaptive approach)? Which of the institutional factors are within EPA's internal control? Which of the factors are dictated from outside EPA and would require external changes?

- **Potential Mechanisms for Facilitating Ecosystem Assessments:** How could any of the institutional impediments be removed, minimized, or mitigated?

- **Resource Needs:** What additional resources would be needed if EPA wished to value a significant array of ecosystem goods and services? Are there ways of reducing the resource needs? Are the necessary resources available? Are the major constraints on resources internal or external to EPA? (Note that this sub-theme will build on the work of other sub-groups.)

d. Relationship of the Theme to Overall Committee Charge and to Other Themes

Institutional factors can constrain EPA's ability to value ecosystem goods and services and may be an area in which the committee can provide important and practical advice to EPA. Institutional factors thus are an important element in addressing the committee's overall charge. Some of the institutional factors may also constitute "contextual influences" and thus be identified and discussed by the first theme group (Biddinger), but the goals of the two theme groups are different. The "Contextual Influences" group will be trying to establish the context for the committee's work, while the "Institutional Framework" group will be trying to see how institutional arrangements can be improved. The work of the "Institutional Framework" group also is likely to parallel the "Alternative Approaches" theme group, but we are looking at institutional factors while they presumably will be looking at the actual assessment models.

e. Metrics of Success

Our group has not discussed this issue yet.

f. Suggestion Briefings, Consultations, Investigations or other Activities

We see at least five immediate areas for investigation. First, it would be very valuable to have initial briefings from EPA (and perhaps OMB) officials at our next meeting on the sub-themes identified above. Because these issues are also relevant to other groups, we believe that it makes sense to have the entire committee briefed on these issues. Second, we would like to obtain copies of relevant documents, including any internal policies/guidances regarding assessments (other than those previously provided to us), any external policies/guidances of relevance, organizational charts (with relevant personnel numbers where possible), any relevant funding documents, and the results of the internal interviews/surveys discussed at the October meeting. Third, we would like to work with agency officials to collect additional information on how existing assessments are carried out by EPA (including a review of how a sample of actual, completed assessments were conducted) and to determine the institutional barriers that EPA believes it would confront if asked to approach their assessments in different manners. Fourth, we would like to have briefings from other federal environmental/resource agencies on both (1) the institutional impediments that they encounter in conducting similar assessments and how they try to overcome those impediments, and (2) the institutional issues that they believe exist in inter-agency assessment work. Finally, we believe that the development of several general case studies could be valuable in investigating the sub-issues in this theme, just as they could be valuable in connection with other themes.