

U.S .Environmental Protection Agency  
Science Advisory Board (SAB)  
Committee on Valuing the Protection of Ecological Systems and Services (C-VPES)  
Summary Meeting Minutes of a Public Teleconference Meeting  
12:30 p.m. - 2:30 p.m. (Eastern Time)  
June 12, 2007

Committee: The SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPES). (See Roster - Attachment A)

Date and Time: June 12, 2007, 12:30 pm - 2:30 pm (Eastern Time) (see Federal Register Notice – Attachment B)

Location: Participation by Telephone Only

Purpose: The purpose of the teleconference is to discuss draft text developed by committee members for a draft report related to valuing the protection of ecological systems and services. (See Meeting Agenda - Attachment C)

Attendees: Members of the C-VPES:  
Dr. Barton H. (Buzz) Thompson, Jr. (Chair)  
Dr. Kathleen Segerson (Vice-Chair)  
Dr. William Ascher  
Dr. Gregory Biddinger  
Dr. Robert Costanza  
Dr. Terry Daniel  
Dr. A. Myrick Freeman  
Dr. Dennis Grossman  
Dr. Louis Pitelka  
Dr. Stephen Polasky  
Dr. Paul Risser  
Dr. Mark Sagoff  
Dr. Paul Slovic  
Dr. V. Kerry Smith

EPA SAB Staff  
Dr. Angela Nugent [Designated Federal Officer (DFO)]

EPA Participants  
Dr. Richard Linthurst, EPA, Office of Research and Development

Other Members of the Public (see Attachment D)

## **Teleconference Summary:**

The teleconference generally followed the meeting agenda (see Meeting Agenda - Attachment C). There were no oral or written public comments received by the SAB Staff for the committee.

The committee chair, Dr. Buzz Thompson, expressed thanks to all contributors to the report and to Dr. Kathleen Segerson and the DFO for integrating material for the June 5, 2007 draft, which was the focus of the teleconference.

### **Overview of Key Concepts, (Part 1, Section 2, pp. 10-20)**

Dr. Robert Costanza introduced the revised “Overview” section by acknowledging written comments (see Attachment E) provided by committee member Dr. Douglas MacLean, who was unavailable for the teleconference. Dr. Costanza noted that some suggested changes were “easy to fix” and others more difficult. One of the more difficult issues involves how to compare values related to different goals or “ends.” Dr. Costanza argued that making tradeoffs between different goals or ends involves treating those ends as different means to an end. He suggested that the text could be altered to include two lines of reasoning (i.e., that some believe that there can be tradeoffs between goals or ends and others believe that that such tradeoffs involve redefining those ends as different means to an end). Other committee members agreed with this suggestion. One member then suggested that Dr. MacLean’s notion is consistent with the view that society can have two separate goals, even contradictory goals that cannot be bridged with a common metric, and still function. In those cases, “functioning” involves working out tradeoffs politically on a case-by-case basis. Other members observed that this view emphasizes that such tradeoffs are situation-specific and cannot be generated *a priori* from an algorithm and that the legitimacy of such tradeoffs depends on the perceived legitimacy of the process for making the tradeoff. The tradeoff is the result of the process and it would be invalid and impossible to claim there is an algorithm to predict the outcome of the tradeoff.

Members then discussed the assumptions underlying the view currently presented in the June 5, 2007 draft report, “...if something is an end in itself this implies that tradeoffs are not acceptable” and the view that any tradeoff between what is perceived as ends actually treats those ends as different means to a single end. This view presumes some substitutability between means that enables the tradeoffs to happen within the context of the new end or goal.

Dr. Mark Sagoff agreed to draft text that reflects the two views discussed above about tradeoffs between different ends or goals and circulate to Drs. Freeman, Costanza, MacLean, and Polasky and the DFO.

The committee then discussed Dr. MacLean's comment that intrinsic value (or goals or ends) can be measured. Members argued that one should not quantify a goal; one should quantify what leads to a goal. For example, if the goal is aesthetic value, one can quantify the degree to which you accomplish aesthetic value, but not the value itself. The committee chair asked Dr. Costanza's subgroup to retain the existing text unless in the near future Dr. MacLean provides alternative text that the subgroup believes should be incorporated.

The committee then discussed Dr. MacLean's comment about revealed preferences. Another member expressed concern about the use of the term "benefits" in the report. Other members did not address that latter issue. The vice-chair suggested that the text clarify on page 15 that the term revealed preference is intended to refer to the specific usage of the term by economists and not to the general usage of the term. Members agreed to this suggestion.

A member asked whether Section 2.4 included sufficient discussion on different views of constructed preferences. Dr. Costanza asked about the text box on this issue. The DFO agreed to resend a draft of the text box to the subgroup working on section 2.4.

Members then discussed advice to EPA related to values held by the public and experts when those values differ. Some members noted that many standard methods routinely break out information about subgroups that exhibit different patterns of preferences so that a decision maker can address these differences. Members acknowledged the need to include a recommendation that EPA should consider input about values from both experts and the public as important input for decisions. Dr. Terry Daniel agreed to draft text on this point and to provide it to the subgroup revising Section 2.4.

Dr. V. Kerry Smith stated that he would provide comments on this section immediately after the teleconference.

Dr. A. Myrick Freeman agreed to incorporate text from Drs. Sagoff and Daniel, the text box provided by the DFO (or alternative text on constructed preferences), address Dr. Smith's comments, circulate it to the subgroup revising Section 2.4 for agreement, and cc the DFO. Dr. Nugent asked for revised text that reflects subgroup consensus to be provided to her by July 6, 2007. Dr. Costanza agreed.

#### EPA's Multi-Year Plan for Ecological Research – Briefing and Discussion

Dr. Nugent introduced Dr. Richard Linthurst, National Program Director for EPA's Ecological Research Program. Dr. Linthurst provided a short briefing (see Attachment G for slides). Dr. Linthurst reviewed the context and goals of his program, which is in the early stages. He envisioned the goal of the program as filling many of the ecological science gaps that were the subject of the C-VPSS discussion and stated that initial results should be seen in Fiscal Year 2009. The intent is to use ecological science

to illustrate how ecosystem services change across space and time in measurable, mappable, biophysical units to assist decision-makers for different kinds of decisions at different scales. Geographic information systems can help decision-maker visualize changes across the landscape in terms of ecological services under different management options. He envisioned information about ecosystem services to be provided to decision-makers and the public directly and providing information to economists and other social scientists to evaluate how services might be valued in economic and other terms under different management regimes. Dr. Linthurst spoke of the need to know how to frame biophysical outputs in appropriate units for other scientists.

He included a description of the “Ecomolecule” graphic (Slide 9) that described a view of current thinking about implementation of the program. One line of effort will focus on the needs of a national program manager addressing a pollutant that is the focus of priority regulation. To support that need, the ecological research program will focus on nitrogen to support work underway on the secondary National Ambient Air Quality Standard for nitrogen oxides. Scientists within the ecological research program will be thinking about ecosystem issues at a national scale and will address the regions and ecological systems that are most sensitive to change. The Agency already requested advice from the SAB’s Integrated Nitrogen Committee on plans for this effort. As a second line of effort, scientists within the ecological research program will also identify the concerns of other federal agencies (e.g., National Oceanic and Atmospheric Administration, Department of the Interior, Fish and Wildlife Service) related to ecosystem service impacts of EPA’s regulatory and policy activity (e.g., wetlands, estuary programs, trading) and work to identify information that EPA can provide them. As a third major activity, scientists within the ecological research program will provide science to support three ecosystems service districts (large area in the upper Midwest, the Willamette Valley, and the Tampa Bay Estuary).

Dr. Linthurst concluded his presentation by noting that ecology can make contributions to national rulemaking that affect ecosystems, to broader policy concerns involving stewardship, and to emerging green accounts. He also noted the potential to provide credible information for market incentives. After describing the vision for the program, Dr. Linthurst acknowledged that he did not have full confidence that the Agency, with the 200 ecologists devoted to this program, knows how to integrate the ecology with the economics and social sciences. He asked for advice about how to get partners in economics and other social sciences to engage in time so that the outputs of the ecological research will be useful to social scientists and economists and decision makers. He noted the relevance of C-VPESS work to the Agency’s research plans and expressed a desire for future interaction.

Committee members then provided some comments and questions. Several members noted that the committee report is consistent with the direction of the research program and commended Dr. Linthurst for the work done so far. One member noted the value of EPA investment in research directions advocated by the committee. One member expressed a concern about resources and the practicality of implementing the approach in multiple places on multiple issues. One member noted the importance of

bringing social scientists and economists together with ecologists at the start of projects, not as experts to “catch the baton” at the end. In response to a question, Dr. Linthurst observed that EPA has a growing understanding of how ecosystems services would contribute to the debate over environmental protection and that the nitrogen example will be influential in demonstrating what can be done. He emphasized the importance of “getting the right people together” to map the entire problem and then focus EPA research on questions that the Agency is capable of addressing within that larger context. A member noted that his approach is similar to the C-VPESSE endorsement of using a conceptual model from the outset of a project. The same member suggested that Dr. Linthurst consider renaming the scope of his activities, or at least his briefing, from ecological research to research on ecological services, if the intent of the activity is interdisciplinary and focuses on ecological services. Dr. Linthurst noted the confusion associated with the title he used and agreed with the intent as stated.

A member made a practical suggestion that he had recently discussed with EPA’s National Center for Environmental Economics another type of research effort getting underway. Since the ecological research program was at an early stage, it would be valuable to set up a web site to disseminate models, data, and other program information as they become available and to provide a platform where people can learn about EPA’s effort and provide feedback. There are examples where this has been done in the social sciences. He pointed to the website for the Panel Study on Income Dynamics, which provides downloadable databases, data, software, committee deliberations, and models. Dr. Linthurst acknowledged the potential value of such a suggestion.

The committee chair concluded the discussion with thanks for the presentation and asked members with additional comments for Dr. Linthurst to provide them through email to the DFO, who would relay them.

#### Predicting Effects on Ecological Systems and Services (Part 2, Section 2, pp. 50-82)

Dr. Kathleen Segerson began the discussion of this section by explaining that the section integrated information previously presented in two different sections of the report on predicting ecological effects and implementing the concept of ecosystem services. She noted that she had worked with Dr. Harold Mooney in developing the text. Dr. Mooney was not available for the teleconference.

One member began the discussion by noting that the most recent draft had a better logical flow and addressed previous problems with terminology related to ecological services, endpoints, indicators and proxies. Other members expressed the view that the text did a good job of integrating previously separate discussions.

Dr. Segerson noted several issues related to the figures in the section. She noted that Dr. Mooney had provided a comment related to Figure 5 but that she believed that the most recent version of Figure 5 was included in the June 5, 2007 draft report. Dr. Pitelka observed that Figure 5 may place too much emphasis on functional groups. He stated that he would correspond with Dr. Mooney, explore the idea of dropping Figure 5

and including text in section 2.4.1 and dropping the separate section 2.4.2, and will inform Dr. Segerson and the DFO of the outcome of that conversation. Segerson noted a comment calling for changes to Figure 3 that would link the figure to EPA's ecological protection activities. In response, Dr. Segerson noted that the intent was to focus on prediction of ecological effects and impacts on services, not to represent the entire valuation process. The committee suggested providing some additional text that would put the diagram in context and to use the text to relate Figure 3 to figure 2, which represents the overall valuation process. Finally, Dr. Pitelka suggested that the bottom oval in Figure 4 referring to "Global Scale" ecological models should be renamed "Landscape and Global Scale." Dr. Pitelka agreed to provide the DFO with specific revised language for this graphic. Dr. Freeman noted that he had not been able to provide comments within the requested timeframe and would provide comments on Part 2 Section 2.

Dr. Segerson noted that it would be desirable to expand the discussion of ecological production functions in Part 2 Section 2 and develop one or more specific recommendations in that section that would also be included on Page 80. Dr. Stephen Polasky agreed to expand this discussion. A member noted that it would be very valuable to provide an example. Dr. Polasky stated he would include some text relating the concept of ecological production functions to Figure 2.

The committee agreed to drop the text appearing on Page 81 and inappropriately labeled as "benefit transfer". They also spoke of the need to be more specific about the distinction between benefit transfer and "generalizability of ecological models" from place to place and scale to scale.

#### Report Conclusions and Recommendations (Part 1, Section 6, pp. 47-48) and Part 5

Dr. Thompson asked members to review the "Straw Proposal for Part 5 (Conclusion)" for the teleconference on June 13, 2007. Members suggested adding the following points:

- the importance of "getting a multiplicity of information to policy members and public"
- sensitizing the Agency and the public to the limitations of benefit transfer
- resources needed for the kind of research program described by Dr. Linthurst

The chair asked the DFO to work to develop a new list of report recommendations that would be cross-referenced to research needs and resource implications. He noted that this could be a topic of a future teleconference.

#### Conclusion of Teleconference

Dr. Thompson adjourned the meeting at 2:30 p.m. with thanks to participants.

Summary of Action Items

1. Dr. Mark Sagoff will draft report text that reflects the two views discussed during the teleconference about tradeoffs between different ends or goals and circulate to Drs. Freeman, Costanza, MacLean, and Polasky and the DFO.
2. The DFO will resend a draft of the text box constructed preferences to the subgroup working on section 2.4.
3. Dr. Terry Daniel will draft text a recommendation that EPA should consider input about values from both experts and publics as important input for decisions and to provide to the subgroup revision Section 2.4.
4. Dr. A. Myrick Freeman will incorporate text from Drs. Sagoff and Daniel, the text box provided by the DFO (or alternative text on constructed preferences), and address Dr. Smith's comments and circulate it to the subgroup revising Section 2.4 (Drs. Freeman, Costanza, MacLean, and Polasky) for agreement and cc the DFO.
5. Dr. Costanza agreed to provide the DFO with revised text that reflects subgroup consensus to be provided by July 6, 2007.
6. Dr. Pitelka will correspond with Dr. Mooney and explore the idea of dropping Figure 5 and including text in section 2.4.2 in section 2.4.1 and dropping the separate section 2.4.2 and will inform Dr. Segerson and the DFO of the outcome of that conversation.
7. Dr. Pitelka agreed to provide the DFO with specific revised language for Figure 4, changing the label for the bottom oval referring to "Global Scale" ecological models to a label such as "Landscape and Global Scale."
8. Dr. Freeman will provide comments on Part 2 Section 2.
9. Dr. Stephen Polasky will expand text discussing ecological production functions in Part 2 Section 2 and develop one or more specific recommendations in that section that would also be included on Page 80.
10. The chair asked the DFO to work to develop a new list of report recommendations that would be cross-referenced to research needs and resource implications

Respectfully Submitted:

/signed/

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Angela Nugent  
Designated Federal Official

Certified as True:

/signed/

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Dr. Barton H. (Buzz) Thompson, Jr.  
Chair  
SAB Committee on Valuing the  
Protection of Ecological Systems  
and Services

List of Attachments

Attachment A: Roster of the SAB C-VPES

Attachment B: Federal Register Notice

Attachment C: Meeting Agenda

Attachment D: Attendees from the Public Who Requested or Were Provided Call-in Information

Attachment E: Comments from Members and Consultants of the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPES) on the 6/05/07 draft report for discussion at the June 12, 2007 C-VPES public teleconference call. Comments received as of 8:30 a.m. Tuesday, June 12, 2007.

Attachment F: Comments provided by Dr. V. Kerry Smith immediately after the June 12, 2007 teleconference

Attachment G: Briefing Slides, Overview of Ecological Research Program, Concept and Basic Approach By Rick Linthurst National Program Director for Ecology

Attachment H: Straw Proposal For Part 5

**Attachment A:  
Roster of the U.S. Environmental Protection Agency  
Science Advisory Board  
Committee on Valuing the Protection of Ecological Systems and  
Services**

**CHAIR**

**Dr. Barton H. (Buzz) Thompson, Jr.**, Robert E. Paradise Professor of Natural Resources Law, Stanford Law School, and Director, Woods Institute for the Environment, Stanford University, Stanford, CA

**VICE-CHAIR**

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

**MEMBERS**

**Dr. William Louis Ascher**, Donald C. McKenna Professor of Government and Economics, Claremont McKenna College, Claremont, CA

**Dr. Gregory Biddinger**, Coordinator, Natural Land Management Programs, Toxicology and Environmental Sciences, ExxonMobil Biomedical Sciences, Inc, Houston, TX

**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**, William D. Shipman Professor of Economics Emeritus, Department of Economics, Bowdoin College, Brunswick, ME

**Dr. Dennis Grossman**, Principal Associate - Biodiversity Protection and Conservation Planning, Environmental and Natural Resources Department, Abt Associates Inc., Bethesda, MD

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

**Dr. Robert Huggett**, Consultant and Professor Emeritus, College of William and Mary, Williamsburg, VA

**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. Louis F. Pitelka**, 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

**Dr. Paul G. Risser**, Chair, University Research Cabinet, University of Oklahoma, Norman, 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. Paul Slovic**, Professor, Department of Psychology, Decision Research, Eugene, OR

**Dr. V. Kerry Smith**, W.P. Carey Professor of Economics, Department of Economics, W.P. Carey School of Business, Arizona State University, Tempe, AZ

#### **CONSULTANTS TO THE COMMITTEE**

**Dr. Joseph Arvai**, Professor, Environmental Science and Policy Program, and Department of Community, Agriculture, Resource and Recreation Studies (CARRS), Michigan State University, East Lansing, MI

**Dr. Allyson Holbrook**, Assistant Professor of Public Administration and Psychology, Survey Research Laboratory, University of Illinois at Chicago, Chicago, IL

**Dr. Jon Krosnick**, Frederic O. Glover Professor in Humanities and Social Sciences, Professor of Communication, Director, Methods of Analysis Program in the Social Sciences, Associate Director, Institute for Research in the Social Sciences, Stanford University, Palo Alto, CA

**SCIENCE ADVISORY BOARD STAFF**

**Dr. Angela Nugent**, Designated Federal Officer, 1200 Pennsylvania Avenue, NW  
1400F, Washington, DC, Phone: 202-343-9981, Fax: 202-233-0643,  
(nugent.angela@epa.gov)

**Attachment B: Federal Register Notice**

Science Advisory Board Staff Office Notification of Two Public Teleconferences of the Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services

[Federal Register: May 16, 2007 (Volume 72, Number 94)]

[Notices]

[Page 27563]

From the Federal Register Online via GPO Access [wais.access.gpo.gov]

[DOCID:fr16my07-71]

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ENVIRONMENTAL PROTECTION AGENCY

[FRL-8315-4]

Science Advisory Board Staff Office Notification of Two Public Teleconferences of the Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

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SUMMARY: The EPA Science Advisory Board (SAB) Staff Office announces two public teleconferences of the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPES) to discuss components of a draft report related to valuing the protection of ecological systems and services.

DATES: The SAB will conduct two public teleconferences on June 12, 2007 and June 13, 2007. Each teleconference will begin at 12:30 p.m. and end at 2:30 p.m. (eastern daylight time).

FOR FURTHER INFORMATION CONTACT: Any member of the public wishing to obtain general information concerning this public teleconference may contact Dr. Angela Nugent, Designated Federal Officer (DFO), via telephone at: (202) 343-9981 or e-mail at: [nugent.angela@epa.gov](mailto:nugent.angela@epa.gov). General information concerning the EPA Science Advisory Board can be found on the EPA Web site at: <http://www.epa.gov/sab>.

SUPPLEMENTARY INFORMATION: The SAB was established by 42 U.S.C. 4365 to provide independent scientific and technical advice, consultation, and recommendations to the EPA Administrator on the technical basis for

Agency positions and regulations. The SAB is a Federal advisory committee chartered under the Federal Advisory Committee Act (FACA), as amended, 5 U.S.C., App. The SAB will comply with the provisions of FACA and all appropriate SAB Staff Office procedural policies.

Background: Background on the SAB C-VPES and its charge was provided in 68 FR 11082 (March 7, 2003). The purpose of the teleconference is for the SAB C-VPES to discuss components of a draft advisory report calling for expanded and integrated approach for valuing the protection of ecological systems and services. These activities are related to the Committee's overall charge: To assess Agency needs and the state of the art and science of valuing protection of ecological systems and services and to identify key areas for improving knowledge, methodologies, practice, and research.

Availability of Meeting Materials: Agendas and materials in support of the teleconferences will be placed on the SAB Web site at: <http://www.epa.gov/sab/> in advance of each teleconference.

Procedures for Providing Public Input: Interested members of the public may submit relevant written or oral information for the SAB to consider during the public teleconference and/or meeting. Oral Statements: In general, individuals or groups requesting an oral presentation at a public SAB teleconference will be limited to three minutes per speaker, with no more than a total of one-half hour for all speakers. To be placed on the public speaker list, interested parties should contact Dr. Angela Nugent, DFO, in writing (preferably via e-mail) 5 business days in advance of each teleconference. Written Statements: Written statements should be received in the SAB Staff Office 5 business days in advance of each teleconference above so that the information may be made available to the SAB for their consideration prior to each teleconference. Written statements should be supplied to the DFO in the following formats: One hard copy with original signature, and one electronic copy via e-mail (acceptable file format: Adobe Acrobat PDF, WordPerfect, MS Word, MS PowerPoint, or Rich Text files in IBM-PC/Windows 98/2000/XP format).

Accessibility: For information on access or services for individuals with disabilities, please contact Dr. Angela Nugent at (202) 343-9981 or [nugent.angela@epa.gov](mailto:nugent.angela@epa.gov). To request accommodation of a disability, please contact Dr. Nugent preferably at least ten days prior to the teleconference, to give EPA as much time as possible to process your request.

Dated: May 9, 2007.  
Anthony Maciorowski,  
Deputy Director, EPA Science Advisory Board Staff Office.  
[FR Doc. E7-9406 Filed 5-15-07; 8:45 am]  
BILLING CODE 6560-50-P

## Attachment C: Meeting Agenda

**EPA Science Advisory Board  
Committee on Valuing the Protection of Ecological Systems and Services (C-VPES)  
Public Teleconference  
June 12, 2007, 12:30 p.m. - 2:30 p.m. Eastern Time**

**Purpose:** The purpose of the teleconference is to discuss draft text developed by committee members for a draft report related to valuing the protection of ecological systems and services.

12:30 – 12:35	Opening of Teleconference	Dr. Angela Nugent, Designated Federal Officer
12:35 – 12:40	Review of Agenda	Dr. Buzz Thompson, Chair Dr. Kathleen Segerson, Vice-Chair
12:40 – 12:50	Public Comments	TBA
12:50 – 1:15	Overview of Key Concepts, (Part 1, Section 2, pp. 10-20) - Summary of written comments and response - Committee Discussion - Next Steps	Dr. Robert Costanza  Committee Dr. Buzz Thompson
1:15 – 1:40	EPA’s Multi-Year Plan for Ecological Research – Briefing and Discussion - Briefing (10 minutes)  - Committee questions and discussion (15 minutes)	Dr. Richard Linthurst, EPA Office of Research and Development  Committee
1:40 – 2:10	Predicting Effects on Ecological Systems and Services (Part 2, Section 2, pp. 50-82) - Summary of written comments and response - Committee Discussion - Next Steps	Drs. Kathleen Segerson and Harold Mooney  Committee Dr. Buzz Thompson
2:10 – 2:25	Report Conclusions and Recommendations (Part 1, Section 6, pp. 47-48) and Part 5 (Supplementary Text to be provided) - Summary of written comments and response - Committee Discussion - Next Steps	Drs. Kathleen Segerson and Buzz Thompson  Committee Dr. Buzz Thompson
2:25 – 2:30	Summary and Next Steps	Dr. Buzz Thompson

**Attachment D: Attendees from the Public Who Requested or Were Provided Call-in Information**

Wendy A. Eichorst  
Lewis-Burke Associates, LLC

Tom Gulbransen, Battelle,

Andrea Hunt, Malcolm Perny

David Nicholas  
OSWER, EPA

Pat Phibbs-Rizzuto  
Chemicals, Science Policy Reporter  
BNA, Inc.  
Daily Environment Report

Anne W. Rea, Ph.D.  
Sector-based Assessment Group  
Office of Air Quality Planning and Standards, EPA

Matt Shipman  
Risk Policy Report

Scott Slaughter  
Center for Regulatory Effectiveness

Katherine von Stackelberg, Sc.D.  
Harvard Center for Risk Analysis  
Harvard School of Public Health

Barbara T. Walton, Ph.D., D.A.B.T., M.B.A.  
ORD, EPA

**Attachment E: Compilation of Comments from Members and Consultants  
of the C-VPES**

Comments from Members and Consultants of the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPES) on the 6/05/07 draft report for discussion at the June 12, 2007 C-VPES public teleconference call.

Comments received as of 8:30 a.m. Tuesday, June 12, 2007.

**Comments Received**

<b>A. Overview of Key Concepts, (Part 1, Section 2, pp. 10-20)</b> .....	16
Comments from Doug MacLean .....	16
Comments from Terry Daniel .....	17
Comments from Rick Freeman .....	20
<b>B. Predicting Effects on Ecological Systems and Services (Part 2, Section 2, pp. 50-82)</b> ...	22
Comment from Terry Daniel .....	22
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**A. Overview of Key Concepts, (Part 1, Section 2, pp. 10-20)**

Comments from Doug MacLean

**Some Comments on Part I, section 2**

**Douglas MacLean**

I think this version is much improved. I like the overall organization, and I am happy to see “value,” “valuation,” and “benefits” more clearly defined. Although the entire section can still benefit from some heavy editing for style, I have a few comments – including some mainly stylistic suggestions – to offer.

p. 10, line 20: Although it will read less elegantly, “well-being” should be substituted for “welfare.” I prefer a consistent use of terms, and “well-being” is the term that is used in other places in this section.

p. 11, line 18: where the phrase reads “...can ensure appropriate...” substitute “...can help to ensure appropriate...” If this change introduces too many uses of the word “help” in the space of three lines, then I’d recommend deleting the word “help” from line 19.

p. 12, lines 4-6: I find this sentence both awkward and misleading. I don’t think it’s correct to regard the distinction between what we value as an end and what we value as means to be “two notions of value.” I suggest replacing the whole sentence that reads “A basic distinction ... (means to an end).” with: “We can distinguish those things we value as ends or goals from those things we value only as means.” (I think this change makes a better transition to the sentences that follow, too.)

p. 12, line 27: Replace “generate” with “contribute to”

p. 12, line 29: Replace “related” with “relate.”

p. 13, lines 10-11: I recommend deleting the sentence that states, “In contrast, if something is an end in itself this implies that tradeoffs are not acceptable.” Or replace it with a different sentence. In the previous sentences, we have characterized instrumental value as value that permits substitutability. The contrast would be that something that is valued in a different way (e.g., as an end) does not permit of substitutability. I think I can live with that. This is not to say whether we can make tradeoffs. I think that it does make sense to speak of rational tradeoffs among things we value as ends. This is different from substitutability. I will illustrate with two examples: (1) Suppose I value gardening as an end, and I value reading fiction as an end. (I know that some people will think that I value both activities as means to my well-being, but I think many people would agree with me that this gets things backward and that it makes sense to think of valuing such activities as ends.) I could decide to spend my entire weekend gardening; or I could decide to spend my entire weekend reading I’d gladly do either, but it would mean foregoing one of the activities I value as an end. Neither activity substitutes for the other – the pleasures each give are very different. I decide to garden on Saturday and to spend Sunday reading. I have made a tradeoff. (2) Suppose I value undeveloped tracts of land in my community because of their natural beauty. Suppose I also value economic growth in my community, and land for development is scarce. I might decide to support a measure that protects some of the undeveloped land while allowing building to take place on other tracts. I have made a tradeoff, but I don’t think I’ve made any substitutions.

p. 14, lines 7-8: The sentence “It does not make sense to attempt to quantify the ‘intrinsic value’ of something.” is not obviously true. In fact, I think it is false. Physical pleasure has intrinsic value, i.e., it is something that it makes sense to value as an end or for its own sake. But surely I can quantify some pleasures (especially when they are of the same kind). Some are more intense than others, some longer lasting, etc.

p. 15, lines 2-5: This sentence claims that revealed preference methods examine choices that people make “in real-world settings where they are maximizing their well-being (utility).” This claim is controversial; I think it is false. Suppose I receive a solicitation from an environmental group asking me to make a donation to support a campaign aimed at stopping the clubbing of seals in the Arctic. I write a check and make a donation. It seems to me that revealed preference theory might say something about how the amount of money I was willing to pay indicates the strength of my preference for stopping the practice of clubbing seals, and it might relate that preference to other preferences I express, including those aimed at my own well-being. But this particular preference has nothing to do with my well-being. I don’t believe that I will benefit in any way from the cessation of this practice. When I decide how much to contribute, I am not thinking in any way of how my well-being will be enhanced. Some of my preferences are for things I value altruistically.

p. 19, line 11: Replace “tenant” with “tenet.”

p. 20, line 3: insert “of concern” between “source” and “relates.” Thus: “The second source of concern relates to...”

Comments from Terry Daniel

P 14, line 6-10

Valuation actually measures relative value in terms of the trade-offs between items that  
7 provide contributions to a goal or end (instrumental value). It does not make sense to  
8 attempt to quantify the “intrinsic value” of something. Only after one has defined the goal  
9 or end does it make sense to quantify the value of items as their contribution toward  
10 achieving that goal (Costanza 2000). [But does it not make sense to quantify/measure the  
relative importance of one end-goal versus another in a given circumstance? Or, does such a  
comparison presume some over-arching “ultimate desideratum” such as the economists’ utility  
or satisfaction or the psychologists’ happiness or self-actualization?]

P 14, line 20-28

Valuation can be expressed in different ways. ~~including monetary units, physical  
21 units, or indices.~~ Economists have developed a number of valuation methods that typically  
22 use metrics expressed in monetary units (“monetary valuation”) while social scientists,  
ecologists and others  
23 have developed measures or indices expressed in a variety of ~~non-monetary~~ units, such as  
24 relative preference or importance ratings or biophysical indices which can be ~~trade-offs.~~  
~~When these measures or indices are~~ used to make judgments about  
25 which outcomes are preferred. ~~these measures are considered a form of “non-monetary  
26 valuation.”~~ For example, ~~landscape management alternatives~~ might be measured in terms  
of  
27 how well they do in conserving biodiversity, where ~~landscape management~~ alternatives that  
28 conserve more biodiversity are preferred (i.e., more valuable).

P 15, line 2-5

Revealed preference methods

3 involve the analysis of choices that people make in real-world settings where they are  
assumed to be attempting to  
4 maximize ~~ing~~ their well-being (utility) subject to a variety of constraints, including limited  
5 income, prices for market goods, and so forth.

P 15, line 23-30

~~Similarly,~~ Social-psychological

24 methods for valuation rely on the more limited assumption that individuals ~~being~~ are well-  
informed about and can express relative preferences for the alternatives they  
25 are being asked to value. These assumptions are problematic in two respects when it  
26 comes to applying valuation methods to ecosystems or services. First, individuals might  
27 act as if they place no value on an ecosystem service if they are ignorant of the role of that  
28 service in contributing to their well-being. In that case, the monetary values that are inferred  
from ~~choices that are analyzed in~~  
29 revealed or stated preference methods, or the relative preferences obtained by ~~those of~~  
social-psychological methods, will not accurately  
30 reflect the contribution that the ~~true value of the~~ ecosystem service makes to their well-  
being or other goals.

P 15, line 30 P 6, line 5

30 reflect the true value of the ecosystem service. In ~~these cases of methods other than revealed~~  
~~1 preference methods~~, it might be possible to provide the individual with information about  
2 the ecosystem service before ~~or at the time of asking~~ the valuation questions. Second, when  
people have  
3 limited information about ecosystem services and ill-formed preferences their preferences  
4 may need to be “constructed” through various forms of discourse.

[The need for relevant information applies equally to revealed preference methods—consider  
the effects of product labeling, especially viz. impacts on threatened species (e.g., on tuna),  
“green” certifications, carbon units, etc.]

P 16, line 28-30, P 17 line 1-4

28 benefit. For example, counting the value of pollinators ~~that increase agricultural output and~~  
29 as ~~a pollination an ecosystem~~ service to agriculture, as well as counting the value of the  
agricultural output, would be double  
30 counting ~~a portion of~~ the value of the pollination services. ~~agricultural production.~~  
Of course, pollinators do provide ecosystem services other than increasing agricultural  
production, such as maintaining specific wild species for aesthetic and existence values and  
increasing biodiversity more generally.  
... If the question of interest is to  
1 know the benefit of pollinators ~~to agriculture specifically~~, then the answer is to find the  
increase in production value  
2 with pollinators versus without. On the other hand, if the question is to know the benefits  
3 created by an agro-ecosystem, then the answer to is find the total value of production ~~for that~~  
~~system.~~  
4 Either approach is valid but combining them is not valid.

P 18, Table 1

~~Non-monetary Valuation: Valuation in which the measure is a non-monetary unit.~~

[The point is that we do not need a special term for all valuation metrics other than money.  
There are currently 19 instances of the term in the report, and all could be avoided easily by  
substituting “and other” (as in “monetary and other valuation methods ...” or simply by  
referring to “valuation methods” (rather than “monetary and non-monetary methods”).]

P 19, line 18-23

18 For complex problems such as ecosystem protection, ~~majority values or~~ values  
19 held by the general population, given ~~that~~ their current ~~understanding of ecological systems~~  
~~information which~~ may be far from  
20 perfect, are ~~therefore not always an~~ not appropriate as a sole basis for public policy  
decisions.

21 Concerns about basing policy decisions on values expressed by individuals from the  
22 general population stem from at least two sources: (1) ill-formed or missing preferences;  
23 and (2) poor or incomplete information.

P 20, line 19-28

19 Policy-makers should look for which of these methods, or what combination,  
20 might give the best assessment of the values of ecosystems and services in particular  
21 circumstances. In circumstances where ~~the~~ lay individuals can be expected to be ~~are~~ well  
informed and ~~to~~ have well  
22 formed preferences for the values in question, ~~they~~ decision makers should put more weight  
on ~~valuation~~ the publics'/stakeholders'  
23 ~~methods such as~~ revealed or stated preferences ~~methods or~~ as measured by economic or  
social-psychological methods.  
24 In circumstances where individuals are ill-informed or have ill-formed preferences,  
25 policy-makers should give greater weight to expert scientific opinion as expressed through  
bio-ecological valuation methods, ~~and~~ while also investigating methods for more ~~to~~ effectively  
linking public and expert judgment-based methods, consistent with a public agency's  
obligation to aggressively pursue public education and involvement. ~~—that measure values~~  
26 ~~of outcomes with expertise of the scientific community to directly model the connections~~  
27 ~~between alternatives and outcomes.~~ Given the uncertainties involved, a judicious use and  
28 comparison of methods is justified.

### Comments from Rick Freeman

First, a general comment. The new Section 2 does not contain the systematic taxonomy or classification of different value concepts that I have been advocating for several years (see memos to the Committee of 12/03 and 5/04). This classification would cover economic values based on presumed known and stable preferences, communitarian preferences, values based on constructed preferences, group processes, biocentric concepts, etc. Some of these concepts are discussed in a very limited and informal way on pp. 14 (lines 11-19, and 15 (lines 8-20). Perhaps it is too much to expect complete agreement on any one taxonomic system (witness the changes in avian taxonomy over the years); but I think that we could come up with something useful provided that it included appropriate qualifications, and discussion of alternative ways in which the classification could be organized.

### Specific comments:

1. P. 10 lines 15-17: Replace with (Comments/explanations are inserted in brackets [] where relevant.):

"Ecosystem services" is an anthropocentric concept denoting the contributions that ecosystems make to people either directly or indirectly [this is from the 4/22 draft]. Ecosystem processes and functions might contribute to the provision of ecosystem services; but they are not synonymous with ecosystem services [The first and second sentences of the 6/5 draft contradict each other, the first saying that ecosystem services are functions, etc., while the second says that they are not.]

2. p. 14, line 4: Change to read: " ... term 'valuation' to refer to the process of measuring values or changes ..." [now consistent with definition in Table 1.]
3. p. 16-17 of the 4/22 draft, on ecological risk assessment and valuation: This is useful material. I agree that it is out of place here. But I hope that it is covered somewhere else.
4. p. 16 line 28: delete "and" at the end.
5. I agree with Doug MacLean's comments. except as follows:

Regarding p. 13, lines 10-11: I am one of those who regard both gardening and reading fiction as means to the end of well-being. I can't say that Doug is wrong to think otherwise. But I think that mine is a useful way of organizing one's thinking. I think that at some level the distinctions between means and ends and between what contributes to well-being and what represents something else get a little fuzzy. On the donation to prevent clubbing of baby seals (see Doug's comment about p. 15, lines 2-5), the fact that the individual gave \$X and not \$2X suggests to me that the person felt that \$X for seals contributed more to his/her well-being than \$X worth of something else, but \$2X of other goods would contribute more to his/her well-being than \$2X to seals.

## B. Predicting Effects on Ecological Systems and Services (Part 2, Section 2, pp. 50-82)

### Comment from Terry Daniel

P 51, the figure

[We should create our own figure here, as an adaptation of the Covich et al. figure. In so doing, we could label the upper endpoints as ecosystem services, to be more consistent with our approach in the report. We might also clear up a few other items in the figure, such as the additional arrows suggested by Bob C. There is also some ambiguity about the large input arrows at the bottom from “Nutrient Loading” (could this be from “natural background conditions”) and the large input arrows on the right side from “Waste disposal” and “Terrestrial Input ...” (are these human inputs or “stressors”?). Perhaps there is an opportunity here to incorporate some of the issues raised in the figure Greg B. suggested, such as distinguishing human introduced or managed stressors on the system, and more clearly emphasizing our focus on changes in ecosystems and services.]

P 63 line 15-19

15 health outcomes are necessary. These outcomes are now understood by disciplines as  
16 different as pulmonary medicine and urban economics (EPA SAB, 2002). The search for  
17 common outcomes that can be valued will be ~~even more~~ especially important in the  
ecological  
18 realm, where biophysical processes and outcomes ~~are even more~~ can be highly varied and  
complex. ~~than~~  
~~19 in the human body.~~

[The original text seems to make rather strong (and unnecessary) claims about relative importance of valuation and about relative complexity in ecosystems versus human physiology/psychology that may not be accepted by everyone—and that certainly does not apply in every instance.]

P 64, line 8-10

8 public communication about what in nature is being gained and lost. While achieving  
9 agreement on a common list might be an important ultimate goal, it is likely to be ~~even~~  
10 ~~more~~ difficult for complex ecological systems, and there is a danger that converging  
prematurely on a limited list of services could misdirect valuation efforts and miss important  
intermediate and end services. ~~impacts than in the context of human health impacts.~~

P 72 Figure

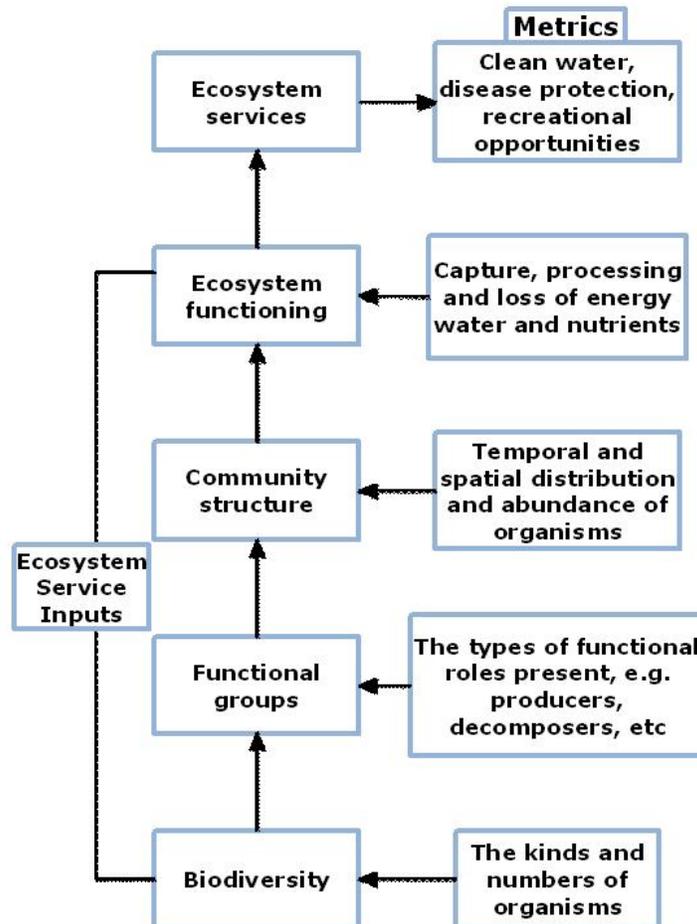
[Again the figure does not sufficiently emphasize changes in ecosystems and services and it does not show any input of either human stressors or management actions that might protect or enhance the systems and its services. Again, features of the figure suggested by Greg B. might be useful here.]

P 75, line 10-24

A couple of specific examples of indicators would really help to clarify this presentation.

Comment from Hal Mooney

I did glance through the draft though and noticed that the first version of the functional grouping figure I sent you was included rather than the second which I sent soon after. In any event, it is attached ...



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P 72 Figure

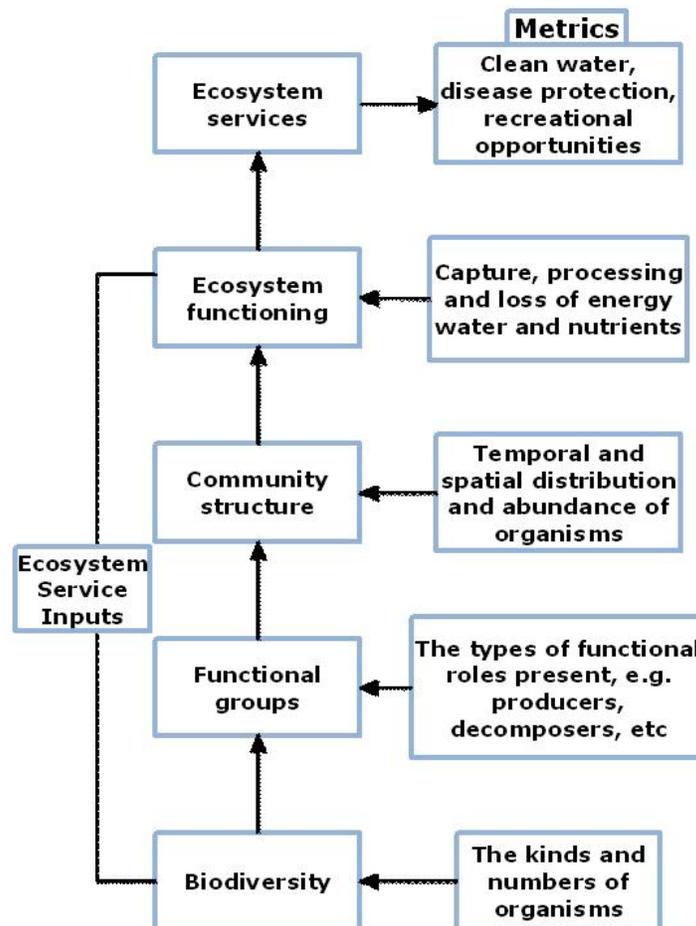
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## **Attachment F: Comments Provided by Dr. V. Kerry Smith Immediately after the Teleconference**

Comments on C-VPSS report 6/5/2007 draft

V. Kerry Smith  
6/12/2007

### **Overall**

Buzz, Kathy, Angela and all who substantively contributed did a wonderful job at pulling together the diverse materials from our various efforts into an informative and thoughtful report. My personal circumstances prevented me from being involved at these key stages so I am especially appreciative of all this hard work.

### **Specific Comments**

1. discussion of valuation of ecosystems as ends in and of themselves –page 13 lines 6-22 on this page raises a potential logical inconsistency; people can value ecosystems as an integrated whole; people can value systems that assure ecosystems are protected regardless of the services they provide to specific individuals –but how can we define a value for ecosystems as an end without some specification of the process leading to the definition of that end. Inevitably that begins with someone –philosophers, ecologists, community activists identifying this criterion as important. In my opinion this link to a group identifying the treatment of ecosystems as an end needs to be discussed.
2. page 14 lines 7-10–there is no mention of the definition of the baseline or starting point; this needs to be included along with the goal or objective; add citation to freeman’s book as well as Costanza; line 17 “..while others are still in need..” omit judgment of novel; not all are novel, and need to make other plural.
3. page 14 lines 20-28 need to highlight benefits are for some change from a baseline set of conditions
4. page 15 line 2 –“..person would trade for the item being valued”; need to say some amount of the item being valued; so the benefit measure or the tradeoff is for a change in the amount from having 2 units to one unit; concept can be extended to consider changes in the quality or the availability
5. page 15 line3 we don’t know they are maximizing utility subject to a budget constraint; moreover we don’t need this to accept their tradeoffs in a revealed preference framework; that comes into the formal machinery of interpreting the results. Say “...in real-world settings are observed to give up resources in exchange for the change in the item of interest.”; line 7 –X needs to be identified as some change from a baseline set of conditions.
6. page 15 lines 28-30–issue is the information provided by sp methods enough.
7. page 18 lines 23-24 –valuation definition is misleading ---need a clear indication of the goal, baseline conditions so that the specified goal is realized

8. page 18, line 35 – “.a positive change” add “in the terms of availability, amount or quality of the good or service”
9. page 20 line 28 –need to understand what each method measures
10. VERY IMPORTANT –page44 line 20-24 sentence beginning “expanding the methods “toolbox”... will allow EPA to more fully represent the benefits of ecosystems and their services” ;this contradicts the earlier statement that term benefits reserved for economic valuations and valuation used for other terms; we need to be VERY clear that benefits ONLY mean the economic valuation because of the Executive Order and OMB guidance. THIS MUST BE CHANGED.
11. VERY IMPORTANT –page 45 lines 3-6 and lines 10-12 --link to toolbox gives impression non-economic measures can be used for the purpose of economic benefits; lines 3-6 –too one sided in favor of non-economic.
12. page 46 –only citations are to Costanza and collaborators –need more examples of others –Palmquist et al integrates economic and ecosystem and the there are others – Marty Smith, Finnoff and Tschirhart –will suggest other citations
13. page 57 point c) lines 25-29 –I don’t know what this means
14. page 62 line23 “...depends on what people care about” drop benefits
15. page 65 point d) lines 26-31 scarcity has meaning within economics; discussion of substitutes or complements in context of ecological systems is not defined. We need to clarify what this means.
16. page 100 –I don’t understand recommendation –how stakeholders affect outcomes of valuation exercises
17. page 114 table discussion of last box hedonic pricing should say marginal willingness to pay
18. page 116 line of table dealing with tradeable permits –what is measured is NOT value of resources but rather the incremental willingness to pay for the reductions in emissions of specific pollutants covered by the permits.
19. page 118 lines 11-13–virtual prices are not defined
20. page 128 lines 4-5; the sentence “ The value of goods and services is synonymous with the benefits” is misleading and contradictory with earlier discussion of economic values; economic values are about tradeoffs a person makes to obtain more of one good service by giving up some amount of something else;
21. page 129 line 6 add incremental before cost
22. page 139 line 11 “...be based by..” use “on” for “by”
23. line 140 lines 26-28 – “...can be included *as separately provided additional information* along with ...”
24. page 141 line2 17-19 need mention of baseline
25. page 146 lines 4-12 outcomes of models need to be coordinated; this discussion is not balanced
26. page 150 line 27-30 recommendation needs to say that co-ordination in selection of endpoints
27. page 152 lines 23-27 EPA’s SAB ‘s EEAC would object to the meta analysis proposed here based on recent discussions of meta analysis of VSL’s
28. page 156 recommendation lines15-16 not sure what this means
29. page 187 lines 13-16 IO interpretation is incorrect –does not measure economic concept of gains
30. page 213 lines 17-19 VERY IMPORTANT --monetary values from deliberate processes do not necessarily yield economic benefit measures

**Attachment G: Briefing Slides, Overview of Ecological Research Program, Concept and Basic Approach By Rick Linthurst National Program Director for Ecology**

Slide 1

Slide 1 is a title slide for the Ecological Research Program (ERP). It features the EPA logo in the top left corner, with the text "www.epa.gov/ord" below it. To the right of the logo, the text "ECOLOGICAL RESEARCH PROGRAM" is displayed in white on a green background, with the tagline "BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS" underneath. The main title "Overview of Ecological Research Program (ERP)" is centered in blue, italicized font. Below the title, the subtitle "Concept and Basic Approach" is centered, followed by "By Rick Linthurst" and "National Program Director for Ecology" in blue. At the bottom left, there is a small blue box containing the text "U.S. Environmental Protection Agency Office of Research and Development".

Slide 2

Slide 2 is a content slide titled "The Ecological Challenge:". It features the EPA logo in the top left corner, with the text "www.epa.gov/ord" below it. To the right of the logo, the text "ECOLOGICAL RESEARCH PROGRAM" is displayed in white on a green background, with the tagline "BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS" underneath. The main title "The Ecological Challenge:" is centered in bold black font. Below the title, the text "Change the economic and human well-being foundation for environmental decision-making" is centered in bold black font. At the bottom left, there is a small blue box containing the number "2".

Slide 3

**EPA** ECOLOGICAL RESEARCH PROGRAM

### Vision

To transform the way we understand and respond to environmental issues by making clear the ways in which our choices affect the type, quality and magnitude of the services we receive from ecosystems -- such as clean air, clean water, productive soils and generation of food and fiber.

3

Slide 4

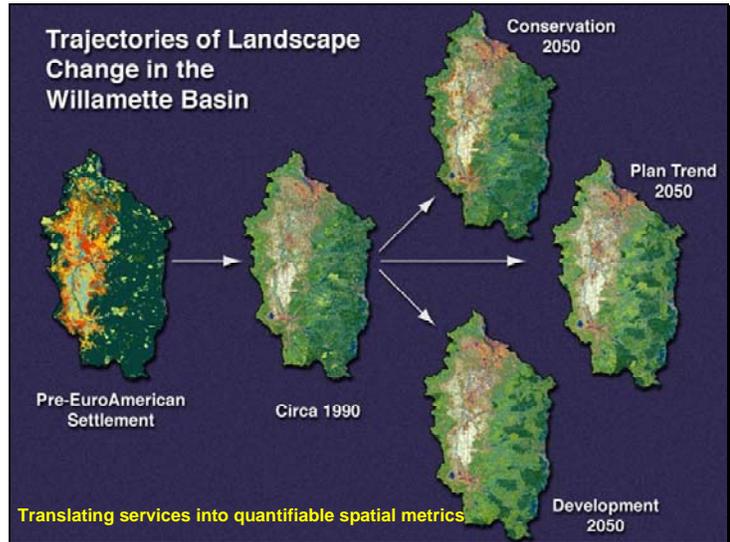
**EPA** ECOLOGICAL RESEARCH PROGRAM

The diagram illustrates various ecosystem services provided by different biomes. Arrows point from the service lists to their corresponding landscape representations. The services listed are:

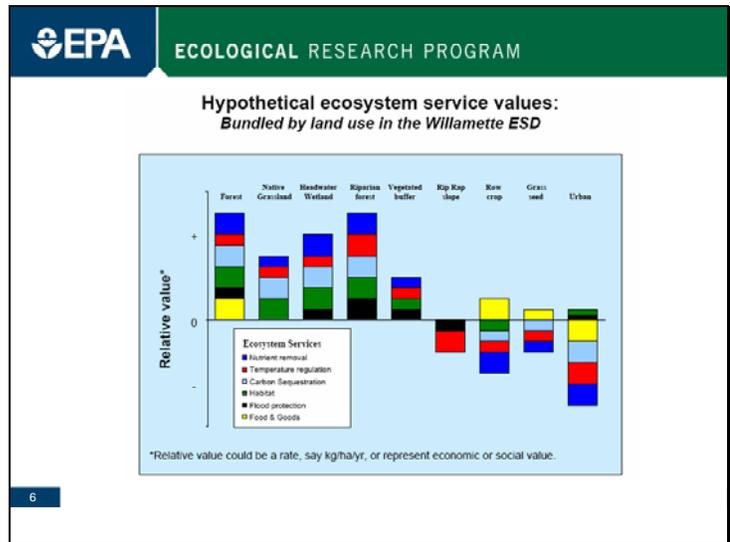
- MOUNTAIN AND POLAR:** Food, Fiber, Fresh water, Erosion control, Climate regulation, Recreation and ecotourism, Aesthetic values, Spiritual values.
- FOREST AND WOODLANDS:** Food, Timber, Fuelwood, Fresh water, Flood regulation, Disease regulation, Carbon sequestration, Local climate regulation, Medicines, Recreation, Aesthetic values, Spiritual values.
- INLAND WATER (Rivers and other wetlands):** Fresh water, Food, Pollution control, Flood regulation, Sediment retention and transport, Disease regulation, Nutrient cycling, Recreation and ecotourism, Aesthetic values.
- DRYLANDS:** Food, Fuelwood, Local climate regulation, Recreation and ecotourism, Cultural heritage, Spiritual values.
- CULTIVATED:** Food, Fiber, Fresh water, Dyes, Timber, Pest regulation, Biofuels, Medicines, Nutrient cycling, Aesthetic values, Cultural heritage.
- URBAN:** Parks and gardens, Air quality regulation, Water regulation, Local climate regulation, Cultural heritage, Recreation, Education.
- COASTAL:** Food, Fiber, Timber, Fuel, Climate regulation, Waste processing, Nutrient cycling, Storm and wave protection, Recreation and ecotourism, Aesthetic values.
- ISLAND:** Food, Fresh water, Recreation and ecotourism.
- MARINE:** Food, Climate regulation, Nutrient cycling, Recreation.

4  
Source: Millennium Ecosystem Assessment

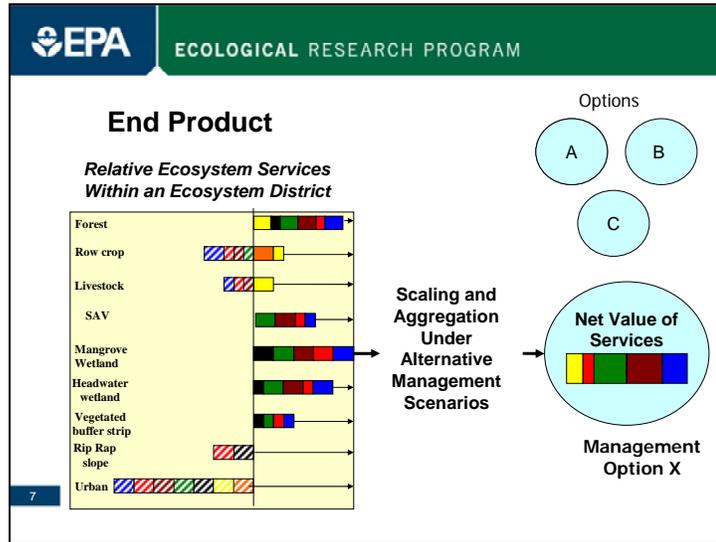
Slide 5



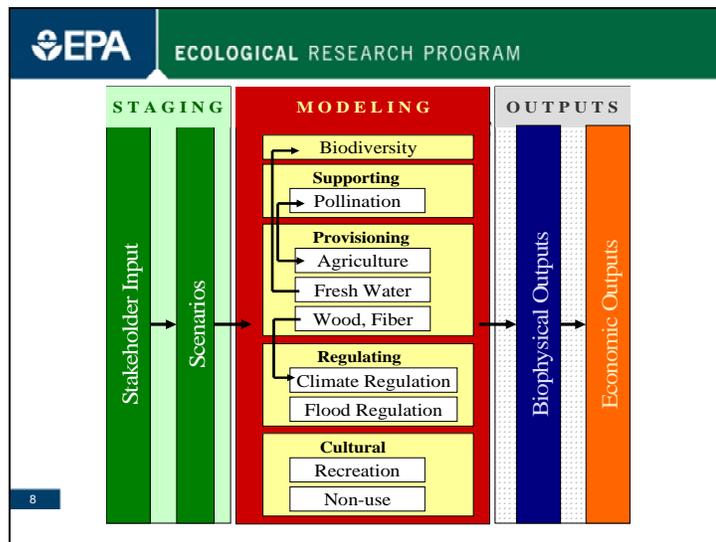
Slide 6



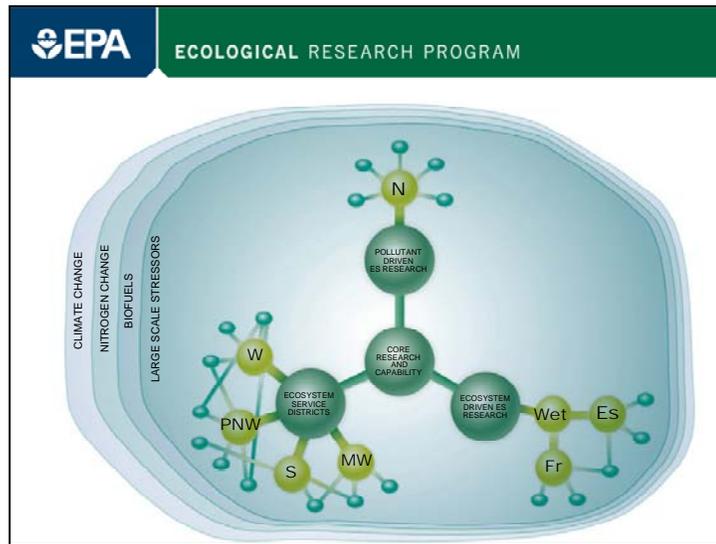
Slide 7



Slide 8



Slide 9



Slide 10

**EPA ECOLOGICAL RESEARCH PROGRAM**

### How can ecology help?

- Create geo-spatial products that describe ecosystem services and potential new ecosystem service production functions
- Develop ways to envision alternative combinations of services and to assess trade-offs.
- Develop methods to restore and enhance ecosystem services through restoring or creating new ecological production functions.
- Identify, quantify, and predict ecological "tipping points" that threaten loss of services.
- Provide information to catalyze innovations in policies and the private sector.

10 2  
4

## **Attachment H: Straw Proposal for Part 5 (Conclusion)**

6/8/2007Draft - SAB Staff-generated document developed at the Request of the C-VPES Chair for discussion at the June 12, 2007 public teleconference of the SAB Committee on Valuing the Protection of Ecosystems and Services

### **STRAW PROPOSAL FOR PART 5 (CONCLUSION)**

#### **Focus on what is different about the approach described in the C-VPES Report and what it offers EPA and the public (drawing on C-VPES Discussion from May 1-2, 2007 Meeting)**

##### What is different?

- . • Approach encourages “thinking big”— trying to understand changes in ecosystems and services related to EPA actions as completely as possible/useful for the decision to be made and in terms of what matters to people
- . • Analysis driven by conceptual model of ecosystems and ecosystem services, not by tradition of what has worked in the past or available data
- . • Explicit recognition of multi-dimensional nature of value. Conscious choice of methods to assess value(s) of interest.
- . • Partnership across disciplines throughout the process
- . • Partnership between experts and publics. High quality, meaningful valuations cannot be performed by experts or publics alone
- . • Transparency about what methods are able to measure, assess and what they’re not (breaking valuation out of the black box)
- . • Experimentation with new methods (e.g., citizen juries, deliberative processes); more sophisticated use and discussion of older methods (e.g., surveys)
- . • Increased, improved information sharing about the use of methods - - across different programs, different places, different scales, so that the practice of valuation is enriched.

##### What can the approach offer EPA and the public?

- . • More robust ecological valuation information can help EPA and the public be more proactive in ecological protection
- . • Valuation related to ecosystem services can help incorporate consideration of ecosystem services in environmental protection decisions
- . • Approach would help to educate publics about ecosystem services and their importance
- . • Clearer communication about valuation and more chance for public involvement in valuation in a meaningful way builds trust in Agency science and decision-making

**Crosswalk of major report recommendations discussed at May 1-2 2007 Meeting against Major Recommendations in Different Parts of the Draft C-VPESSE Report**

<b>Recommendation</b>	<b>Part 1</b>	<b>Part 2</b>	<b>Part 3</b>	<b>Part 4</b>	<b>Part 5</b>
1. Think big—trying to understand ecological systems and services as completely as possible/useful and what matters to people...analyze changes related to EPA actions	included	included	included	included	
2. Highlight the concept of ecosystem services and provide a mapping from changes in ecological systems to changes in services or ecosystem components that can be directly valued by the public; a. Start out with a conceptual model that captures all ecological services of concern and mapping b. Conduct valuation looking at multi-media impacts c. Make sure you have the top and bottom of the diagram and linkages between them (production function linkages) (Part 2) d. Use ecological valuation information to be proactive in environmental protection	All included except for d	2(a) included but not much on d	Doesn't address a,b,c,d	All Included except for )	

<b>Recommendation</b>	<b>Part 1</b>	<b>Part 2</b>	<b>Part 3</b>	<b>Part 4</b>	<b>Part 5</b>
<p>3. Expand the range of ecological changes that are valued, focusing on valuing the ecological changes in systems and services that are most important to people and recognizing the many sources of value, including both instrumental and intrinsic values</p> <p>a. Requires input from interdisciplinary group of scientists and stakeholders (pro-active education)</p>	included	<p>3 included but</p> <p>(a) not covered – re need for pro-active education</p>	<p>Doesn't come through</p>	Included	<p>Could address 3(a)</p>
<p>4. Utilize an expanded set of methods for identifying, characterizing, and measuring the values and services associated with these changes.</p> <p>a. Recognize that value is multi-dimensional; make conscious choice about methods appropriately based on values and context of decision</p> <p>b. Utilize local and regional opportunities to further develop an expanded set of methods that can be transferred to the national level</p> <p>c. Communicate clearly what methods measure and do not measure</p> <p>d. Don't limit valuation to what is able to be monetized —implement Circular A-4 in reverse order—analysis</p>	Included	<p>No generally except for (c) (in Uncertainty and communication section)</p>	<p>Included for 4, (a),(c),(e); doesn't cover (b) or (d)</p>	<p>Included for 4, (b),(d),(e); doesn't cover (a) or (c)</p>	

resources should be distributed to reflect range of services and communication reflect full range of services e. Information sharing within EPA and with other Agencies					
5. Involve an interdisciplinary collaboration among physical/biological and social scientists and solicit input	Included	Included	Not included	Included	

<b>Recommendation</b>	<b>Part 1</b>	<b>Part 2</b>	<b>Part 3</b>	<b>Part 4</b>	<b>Part 5</b>
from the public or representatives of individuals affected by the ecological changes from the outset of valuation effort					
6. Possibly group recommendations regarding learning within Agency Use broadened set of methods; accumulate experience and information that can be used in rulemaking by using them in other contexts	Included	Included (Benefit transfer section)	No	Included	
Other points from the Meeting					

-The importance of partnership between publics and experts	Included- but could be stronger	Included (ecosystem services)	No	Included	
-Communications	Included	Included	Only some methods (sociopsych, mediated modeling)	Included	
-Importance of context	Included	No	Included	Included	