

U.S. EPA Science Advisory Board Committee on Valuing the Protection of Ecological Systems and Services (C-VPES) Public Teleconference March 26, 2008, 1:00 p.m. – 3:00 p.m. (Eastern Time)

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

Date and Time: March 26, 2008, 1:00 p.m. – 3:00 p.m. (Eastern Time)

Location: Participation by Telephone Only

Purpose: The purpose of the teleconference is to reach committee consensus on 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 (Chair)

Dr. Kathleen Segerson (Vice-Chair)

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. Douglas MacLean

Dr. Louis Pitelka

Dr. Paul Risser

Dr. Holmes Rolston

Dr. Joan Roughgarden

Dr. Mark Sagoff

Dr. V. Kerry Smith

Consultant to the C-VPES:

Dr. Joseph Arvai

EPA SAB Staff

Dr. Angela Nugent [Designated Federal Officer, DFO]

Other Members of the Public (see Attachment D)

Teleconference Summary:

The teleconference generally followed the meeting agenda (see Meeting Agenda - Attachment C) to continue discussion of the March 2008 C-VPES draft.

After the DFO opened the meeting and took the roll, the chair reviewed the agenda. He noted that the purpose of the teleconference and the contingency teleconference planned for March 27, 2008 is to reach agreement on the draft report. He noted that the report had been shortened to reduce redundancy. Where there are suggestions for additions, they must be necessary ones for the document and ones for which the committee has consensus. He reiterated the plan described in previous teleconferences to address disagreements within the committee by, in the following order, finding compromise language or deleting problem text from the report; expressing the range of different views; or if such strategies are not possible, including minority reports.

He noted that the committee will review only those written comments that require committee discussion. He stated that all comments not discussed would be addressed through revisions or one-on-one discussions with the commenter. He asked the DFO to circulate a list of changes based on the teleconference discussion and previous planning calls held with the vice-chair and the DFO. He asked members to provide any additional comments to the DFO immediately after the call and, after the list of changes have been circulated, to let the DFO know immediately if anything has been left off the list.

The chair then opened the discussion of organizational and substantive issues, beginning with organizational issues and proceeding with the substantive issues chapter by chapter. Appendix F to these minutes provides a table summarizing resolution of the issues. The narrative below covers only those significant points of discussion not included in Appendix F.

The committee agreed to move the survey appendix and detailed method information to the web. Members expressed the desire that the web information be made permanently available. One member suggested that the detailed method information be included in the *Encyclopedia of Earth*, a peer-reviewed alternative to Wikipedia. The chair asked committee members to provide the DFO with specific information about permanent repositories or web-accessible platforms for the committee-generated detailed information about valuation methods.

The committee discussed draft chapters 1 through 4 and the disposition of the Appendix materials. The chair announced that the contingency teleconference would be held March 27, 2008, as announced in the Federal Register

Summary of Action Items

1. Committee members will provide the DFO with specific information about permanent repositories or web-accessible platforms for the committee-generated detailed information about valuation methods.
2. DFO will circulate a list of the discussion items and written comments and their disposition.

Respectfully Submitted:

Certified as True:

Angela Nugent
Designated Federal Official

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: Response to Comments Received for or Discussed at March 27, 2008 C-VPES Teleconferences

**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, Senior Policy Advisory, The Nature Conservancy, 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, 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

PDF Version (2 pp, 83K, About PDF)

[Federal Register: March 4, 2008 (Volume 73, Number 43)]

[Notices]

[Page 11636-11637]

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

[DOCID:fr04mr08-63]

ENVIRONMENTAL PROTECTION AGENCY

[FRL-8537-3]

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.

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 the Committee's draft report related to valuing the protection of ecological systems and services.

DATES: The SAB will conduct two public teleconferences. The public teleconferences will occur on March 26, 2008 and March 27, 2008. The call on March 26, 2008 will begin at 1 p.m. and end at 3 p.m. (eastern daylight time). The call on March 27, 2008 will begin

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at 1 p.m. and end at 2 p.m. (eastern daylight time).

FOR FURTHER INFORMATION CONTACT: Any member of the public wishing to obtain general information concerning the public teleconferences may contact Dr. Angela Nugent, Designated Federal Officer (DFO), via telephone at: (202) 343-9981 or e-mail at: 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 teleconferences is for the SAB C-VPES to discuss the Committee's draft advisory report calling for expanded and integrated approach for valuing the protection of ecological systems and services. The discussion is 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 teleconferences. 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) five business days in advance of each teleconference. Written Statements: Written statements should be received in the SAB Staff Office five 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. To request accommodation of a disability, please contact Dr. Nugent preferably at least ten days prior to the teleconferences to give EPA as much time as possible to process your request.

Dated: February 27, 2008.
Anthony Maciorowski,
Deputy Director, EPA Science Advisory Board Staff Office.

Attachment C: Meeting Agenda

**EPA Science Advisory Board
Committee on Valuing the Protection of Ecological Systems and Services (C-VPES)
Public Teleconference
March 26, 2008, 1:00 p.m. - 3:00 p.m. (Eastern Time)**

Agenda

Purpose: The purpose of the teleconference is to reach committee consensus on a draft report related to valuing the protection of ecological systems and services.

1:00 – 1:05	Opening of Teleconference	Dr. Angela Nugent, Designated Federal Officer
1:05 – 1:10	Review of Agenda	Dr. Buzz Thompson, Chair Dr. Kathleen Segerson, Vice-Chair
1:10 – 2:45	Discussion and Resolution of Committee-identified issues	Committee
2:45– 3:00	Summary and Next Steps	Dr. Buzz Thompson
3:00	Adjourn	

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

Members of Public Requesting Information about March 2008 Calls

Larry Biles, University of Georgia

Jorge Brenner, Ph.D.
Texas A&M University - Corpus Christi

Robert Brown, North Carolina State University,

Steve Bullard, University of Kentucky

Jim Christman
Hunton & Williams
Richmond, VA

Adam T. Deck
U.S. Army Center for Health Promotion and Preventive Medicine

W. Barry Gillespie, Jr., Ph.D.
Entrix
Houston, Texas

Maria Hegstad
Inside Washington Publications

Brian Kleinman
Office of Management and Budget

Anne W. Rea, Ph.D.
Office of Air Quality Planning and Standards
U.S. EPA;

B. Sachau
Florham Park, NJ

Attachment E: Response to Comments Received for or Discussed at March 26, 2008 C-VPESSTeleconferences

Response to Comments Received for or Discussed at March 26, 2008 C-VPESSTeleconference

Chapter 1

1.	page 4 line 17 – birds and animals?	Bostrom	Insert language suggested by Lou Pitelka: "a forest ecosystem consists of the trees in the forest, all other living organisms, and the non-living environment with which they interact."
2.	p. 4 line 22: Is the reference to “Daily” supposed to be “Herman Daly”? The references between “Cu” and “Daniel” are missing.	Ascher	Reference will be added for Daily, G.C. 2007. Ed. Nature's services: Societal dependence on natural ecosystems.. Washington, DC: Island Press References throughout will be scrubbed (text against reference list)
3.	p. 4 line 25 delete one of the double commas.	Ascher	Will do
4.	Page 5 lines 13-14 edit to read “and on the structure and functions of communities and ecosystems.”	Bostrom	Will do
5.	Page 7 line 20: reference the methods appendix here.	Bostrom	Will do

Chapter 2

1.	Pg. 8, line 7. Perhaps delete phrase "... who are often the dominant organisms" referring to humans. I didn't think it is necessary or even true. How do you even define dominant in an ecosystem?	Slovic	Delete phrase
2.	p. 8 line 16: Add after "well-being:" (which encompasses both physical well-being and psychological gratification) . As it stands, the implication is that only physical well-being is considered.	Ascher	Will add the parenthetical at the end of the sentence
3.	p. 9, line 14-23: Discuss the avoidance of double counting - as an advantage of the Boyd Banzhaf approach.	Freeman	Insert brief discussion
4.	pg 10, lines 6-9: "People assign or hold all values" and the following discussion imply that without perception there is no value.	Costanza	<p>Insert/Adapt text provided by Kerry Smith for insertion on page 10 or at the start of section 2.1.3 (introducing the difficulty of discussing "values" and agreements by the committee for the report.):</p> <p>"The task of distinguishing what is valued from the concept used to define the value is complex, regardless of the disciplinary perspective adopted. It requires a framework to distinguish the information available, perceptions, and decisions or actions. These distinctions must be relevant to the person responsible for specifying how a measure of the amount of the</p>

		<p>object to be valued is defined and how that measure is separated from the definition and corresponding measure of the value concept. This is inevitably an analytical process that abstracts from the real world. Each discipline addresses these issues differently, and this is potentially a source of confusion and miscommunication. Nonetheless to make progress in any analysis of the consequences of change it is essential to make assumptions and define a structure based on them. The committee's discussion in what follows makes a set of key assumptions, and the resulting structure cannot be evaluated independent of these assumptions. As a result this report attempts to systematically document each step in the committee's chain of reasoning. This is not the only possible structure. Rather it is the structure that allowed the interdisciplinary set of experts constituting the C-VPES to make progress on the complex set of issues associated with valuing changes in ecosystem services in a way that may be relevant for EPA's</p>
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			policy processes.” See related point 21 and response
5.	<p>Page 10 lines 6-18: This passage does not reflect the extant empirical evidence on how people use the term value and what kinds of values they hold.</p> <p>Would the committee consider including at least part of this paragraph as a footnote, at least (proposed previously as part of the introduction to the old chapter 4): Various described by sociologists and social psychologists as beliefs, goals, or even cultural imperatives, stable sets of values (e.g., benevolence, self-direction, security, hedonism, and others) have been identified across cultures and over time (Hitlin and Piliavin, 2004). Values have also been described along dimensions such as conservation versus openness to change, and self-enhancement versus self-transcendence (Schwartz, 1994). Values are sometimes conflated with attitudes (which are positive or negative evaluations of an object), traits (which are enduring attributes of personality), norms (which are situation specific) or needs (which are biophysical influences on behavior) (Hitlin and Piliavin, 2004).</p>	Bostrom	Don’t add the proposed footnote because the report focuses on values of ecosystem protection, not “held values”
6.	P. 11, line 11: “accept compensation <u>for a loss.</u> ”:	Freeman	Add “for its loss.”
7.	P. 11, line 20: “how they are related.”		Make change
8.	Page 11 line 16: the “determined to be important prior to valuation” is ambiguous and a little problematic. Where does the valuation process start?	Bostrom	Delete the referenced phrase.
9.	Page 11 bottom: Table 1 in the proof that Angela sent around does not reflect the hierarchy shown in the draft, which makes it confusing.	Bostrom	Graphic lay-out will be corrected
10.	Pages 12-13 – it would be helpful if these sections had somewhat more parallel structures. While the section on constructed preferences starts out with assumptions, the section on economic values doesn’t. Move lines 10-13 to the	Bostrom	Make text more parallel

	beginning of the economic values section, to make it more parallel?		
11.	P12, L16-19— If relevant assumptions of economic theory are accepted , expressing economic values in monetary terms allows a direct comparison of the values of ecosystem services with the values of other services produced through environmental policy changes (e.g., effects on human health) and with the costs of those policies	Daniel	Make change
12.	Page 12 line 21: Replace “premise” with “evidence” so that the sentence reads something like: “In contrast to economic valuation methods which are based on assumptions of rational and stable preferences, values as elicited by those who study constructed preferences are based on substantial evidence that, particularly when faced with unfamiliar choice problems, individuals do not have well-formed preferences and hence values (ADD references back here – eg. Fischhoff, Slovic, Grether and Plott, Lichtenstein and Slovic, etc). “	Bostrom	Change text so it reads “those who study constructed preferences conclude that evidence demonstrates that, particularly...” Add references
13.	- I haven't seen an explicit statement that the results of different valuation methods are not comparable and can not be used for validity tests.	Freeman	Insert discussion of this point in Chapter 2 o4 4
14.	Here is some alternative wording for the "Energy-based values" section on pg. 14, lines 8-13 Energy based values are based on the idea that the direct plus indirect energy cost of producing a good or service reflects its total cost, including both costs captured by the market and those that are not. Under certain conditions this total cost is assumed to be a reasonable proxy for value. Two advantages of this approach are that (1) it is applicable to both the marketed and non-marketed parts of the system, including ecosystems and their services and (2) it is not completely dependent on individual human preferences (although human preferences and choices do affect rates of energy transfer and the resulting cost estimates)	Costanza	Change text so it reads: Energy-based values are defined as the cost of the direct and indirect energy required to produce a marketed or un-marketed (e.g., ecological) good or service. In contrast to economic values, energy-based values are not defined in terms of the tradeoffs that individuals are willing to make, and hence the two concepts of value are conceptually

			distinct. Nonetheless, researchers who advocate the use of energy-based values have found that in some cases energy cost estimates are similar in magnitude to economic measures of value.
15.	Page 14, line 22. Make change in blue ...”the term “valuation generally refers to the process of measuring the value of a change in something. Thus in the context of an ecosystem...	Smith	Change sentence to “the term valuation in the context of an ecosystem refers in this report to the process of measuring the value of a change in that ecosystem...
16.	Pg. 14, lines 21 and 22. Suggested change. The term valuation, in this report, refers to the process...	Slovic	Make change as indicated immediately above
17.	I wanted to follow up on the discussion regarding the Committee's use of the word 'valuation' within this report.... The editing should come on p. 14 at the beginning of Section 2.1.4. The current wording in lines 21 and 22 of the introduction is wrong; the term "valuation" does NOT generally refer to the process of measuring the value of a change in an ecosystem. We need to say that: The VPESS Committee is defining the term "valuation" to mean the process of measuring the value of a change in an ecosystem to provide guidance on the actions of EPA which is the context of this report.	Grossman	Make change as indicated immediately above
18.	p. 14, line 29. Add to paragraph “In some cases, the with and without may not be sensible.”	Smith	Add sentence that reads “Indeed, in some cases, the world with or without the ecosystem may not even seem sensible.”
19.	P15, L10-13--Individuals might respond to a survey, make purchases, or otherwise behave as if they place no value on an ecosystem service if they are ignorant of the role of that service in contributing to their well-being or other	Daniel	Make change

	goals.		
20.	P15, L14—There may be occasions where assessments of existing, uninformed attitudes and values held by the public are desired, such as when designing communications to improve understanding of ecosystems or services or soliciting public support for specific protection policies. In most cases, however, valuation should seek to measure the values that people hold and would express if they were well informed about the relevant ecological and human well-being factors involved.	Daniel	Make change
21.	Pg. 15, lines 14-25 gets close to the nub when it states that “Although valuation should be informed by the best available science, it ultimately seeks to reflect the values that would be held by a fully informed general public, not merely the personal values or preferences of scientists or experts.” But what values would be held by a fully informed general public?	Costanza	Address issue in part by textual changes provided by Terry Daniel, immediately above. Also <ul style="list-style-type: none"> • Identify this definition as a working definition • Refer to text on page 64, L 5-14 • Identify opportunity for research. One research possibility is to compare surveys of a range of fully informed experts around an issue and an educated sample the general population “brought up to speed.” Are you going to get similar results? Another research issue: when you survey general public, what is the significance of their framing themselves as citizens vs.

			individuals
22.	Page 15 line 25: Any reason not to include a more accessible (eg. recent) reference along with Berelson? Lots are provided in other parts of the report.	Bostrom	Add citation suggested by Ann: National Research Council,1996. Understanding risk: Informing decisions in a democratic society. Washington DC: National Academy Press.
23.	Page 16 line 22: replace “must be” with “are” Page 16 line 27: replace “must be” with “are” and “cannot” with “may not” If references are not provided on page 12, then they should be provided here, to guide those who wish to follow up on this.	Bostrom	Will do
24.	P16, L 32+--Requiring these individuals to express such values in monetary equivalentents (e.g., in a Contingent Value survey ...	Daniel	Make Change
25.	Pg. 18, line 31. Delete extra “the	Slovic	Make change
26.	P. 18, lines 22-23: What are Supplemental Environmental Protection Penalties? Need a reference?	Freeman	Insert description and reference
27.	P. 18, lines 26-27: What permitting programs involve protecting ecological services? Permits under the Clean Water Act are based on technology of control.	Freeman	Check with Agency and provide explanation or citation or correction.
28.	p. 20, line 14. insert blue text “ This may create a bias toward the status quo...” (claim of bias too strong without “may”)	Smith	Make change
29.	Pg. 20, lines 18-19 sees serious limitations... Further thought: how serious is this limitation “from relying solely on previously approved methods”? Apart from the use of methods that have passed muster with OMB in particular circumstances, what does the term “previously approved” really mean? I think any past approval has been more	Slovic	Change “approved” to “accepted”

	passive (lack of protest) than active.		
30.	Pg. 21, lines 3-6. This important paragraph seems vague and weak. Can we say more about how seriously to take analyses done under limiting constraints? Do such limited analyses do more good than harm? How do we know?	Slovic	Insert language pointing readers to specific recommendations to strengthen valuation for national rulemaking in section 6.1.4
31.	P. 23, lines 19-25: Not clear. Explain “bottom up” approach.	Freeman	Will review language and clarify
32.	Pg. 24, lines 19-20. recognize this broader purpose and to address it. Or, something stronger than “consider it”.	Slovic	Revise sentence to end as follows: “to recognize broader purpose.” Drop remainder of the sentence
33.	Page 25 lines 1-4: shouldn’t this list include stakeholder or public involvement early on? (as implied by line 13)	Bostrom	No change needed. The point is implicit and developed in section 2.3.1
34.	Page 26 lines 22 and 23 – typos	Bostrom	Correct
35.	Page 28 line 29: edits surveys to read “surveys or interviews”	Bostrom	change to “surveys, interviews, or small focus groups”
36.	Pg. 28. Section 2.3.3. I’m uneasy about this section. It gives too much deference to OMB Circular A4. I doubt that the draftees of Circular A4 had the depth of understanding of the complexities of valuation that are described in our report (note the harsh judgment that the National Academy of Sciences handed down in 2007 on OMB’s guidelines for Risk Assessment). I believe that somewhere in our report we should challenge OMB, calling for a need to revisit circular A4 in light of our committee’s findings. Why should national rule making be exempt from the valuation considerations we identify as relevant for other contexts. It’s wrong! [Post-script: I see later on pg. 135 a very constructive attempt to deal with OMB in the short-run. This is good, but// for the long-run, a critique of OMB is needed, I think.]	Slovic	Committee did not feel comfortable making this change. Purpose of this report is to provide to EPA within the existing legal and regulatory constraints.

37.	P28, L29-30--For example, surveys or small focus groups in which individuals indicate the importance of different environmental and other concerns might provide information ...	Daniel	Change to “surveys, interviews, or small focus groups”
38.	Page 28 line 30: delete “small”	Bostrom	Make change
39.	P. 29,, line 1: “Proxy” is the wrong word. Perhaps “an indicator of ...”?	Freeman	Make change
40.	Page 29, line 1-2—proxy especially important to me to remove	Smith	See Freeman comment immediately above and resolution
41.	P29, L6-7--...Circular A-4 requires that benefits be quantified when they cannot be monetized; bio-ecological or attitude/judgment-based metrics provide potentially useful forms of quantification... {to be consistent with the labels used in 2.1.3}	Daniel	Change to “some bio-ecological or attitude/judgment-based metrics “
42.	Pg. 29, line 15. What is the status of information gained by exploring supplemental approaches?	Slovic	No change necessary. Next paragraph describes how information could be used.
43.	Pg. 29, line 22. Again what does exploring mean here?	Slovic	Change to “exploring and evaluation.”
44.	Pg. 29, lines 24-25. Doesn’t this call for appropriate validity “in all cases” apply to national rulemaking too?	Slovic	No need for change. The call does apply to national rule making.
45.	Pg. 30, line 1-8. But doesn’t such a validity check need to be done at least once in the course of certifying a method as “valid” for use? This is called “convergent validity” in psychometrics.	Slovic	Page 30 will be rewritten and point clarified.
46.		Freeman	Make change

	P. 30, line 2: “alternative” instead of “alternate”?		
47.	Pg. 30, lines 4-5. Yes, confidence can be increased. But it is also decreased if and when multiple methods produce very different values.	Slovic	Include discussion of this scenario.
48.	Page 30 paragraph starting line 9 – if differences in underlying assumptions controlled and tradeoffs elicited explicitly, then values should in theory be possible to aggregate across methods, no?	Bostrom	Page 30 will be rewritten.
49.	Pg. 30, lines 9-27. The key issue associated with using multiple methods is not aggregation (adding) but rather comparing the output of supposedly equivalent measures. If they don’t agree, convergent validity is lacking. One or more measures, or the entire measurement protocol becomes suspect.	Slovic	Expand this discussion in revisions of page 30 <ul style="list-style-type: none"> - Discuss how decision maker would deal with results from multiple method - guard against describing “conflicting” information as uncertain - identify opportunity for research - How to utilize information from different analytical frameworks?
50.	Page 30 lines 18-20: This implies that the two are completely separate and distinct, which is not necessarily the case. If an economist and a psychologist both ask someone if they would pay \$10 for a specific environmental improvement, aren’t the answers comparable, regardless of their underlying premises?	Bostrom	Page 30 will be rewritten and language clarified.
51.	Pg. 30, line 25. How should information about non-economic values be considered separately? What does this mean? Do such values have “standing” in the deliberations equivalent to that afforded economic benefits?	Slovic	Point more clearly to discussion in Chapter 6, p. 135

52.	p. 31, lines 4-7: These two tasks seem to be out of order, in relation to the prior statement that finding out what the public regards as important should guide the examination of bio-physical responses, as well as lines 17-18 “a projected bio-physical effect might suggest human-social values that were not initially considered”—implying that the human-social values normally would come first.	Ascher	Move discussion of iterative nature of process before the list in section 2.4.
53.	Pg. 32, line 9-16. Different contexts for valuation will be governed by different laws, principles, etc. Shouldn’t we be arguing that these laws need to be reconsidered. How about a call for “harmonization” in light of the “wisdom” in our report?	Slovic	Committee did not feel comfortable with this recommendation.
54.	Pg. 33, lines 20-23. I’m not sure this statement about risk assessments not providing information about the societal importance of consequences is correct. Good risk assessments should consider significance of adverse effects.	Slovic	Change language, line 21, to read “Typically, risk assessments primarily focus...”
55.	Page 34 lines 16-22: how else will the early identification occur unless there is early engagement of some sort (even interviewing) with involved or affected parties? Move lines 1-3 on page 35 to the top of the list, to clarify?	Bostrom	Move up in chapter 2 and in conclusion
56.	P. 34, lines 23-27 – need to emphasize the effects of the variables creating the changes or ecological responses, recognizing those under control of policy makers thru existing and potential regulatory processes	Smith	revise language to clarify that the approach would “predict ecological response to EPA decisions or actions in value-relevant terms”
57.	Pg. 35, line 4-16. Again this gives too much deference to OMB and economic methods. Yes, economic valuation is a “mainstay”, but should it be? Is not economic valuation also in a developmental state? What does it mean to experiment with other methods? Just out of curiosity? Are they second class? Why? Why should such experimentation be done only in less prescriptive contexts? This implies second class status. I disagree. Some non-economic methods may be logically more defensible than some economic methods.	Slovic	<ul style="list-style-type: none"> • Develop paragraph describing the nature of the evaluation to be conducted within EPA’s context for choosing and using a method. • Describe briefly plan for

			<p>evaluation where EPA would test and examine value of methods in contexts relevant to EPA as part of an overall process that would set up criteria for evaluation and choosing what methods to utilize</p> <ul style="list-style-type: none"> • Frame this activity as relevant to research • Avoid term “experiment” because it marginalizes methods EPA is not currently using
58.	<p>P. 35, lines 4 – 10. marginal note “where there is not capacity to develop economic methods”</p> <p>-Experimentation discussion must include method for evaluation and criteria for what is to be learned; context must be one consistent with regulatory mandates; this needs expansion.</p>	Smith	See response to 57
59.	<p>P. 35, it says: “In the context of national rule making, the Agency should conduct one or two model analyses (perhaps one prospective and one retrospective) of how the use of a wider range of methods might be applied.” But if the methods measure different things, what is learned from this? And which other methods do we recommend that EPA try</p>	Freeman	See response to 57
60.	<p>I think that we need further Committee discussion of the recommendation on p. 35 that EPA should experiment with the use of other valuation methods. I am not convinced that this is a wise use of Agency resources at this time, especially in the context of national rule-making (lines 10-12). I would like to hear some discussion of:</p> <p>- Which methods do we think that the Agency should experiment with? All of them? Or are some better candidates than others?</p>	Freeman	See response to 58

	- So they use method Y and get result X. What have we learned? How could this "guide the Agency's valuation efforts as it conducts subsequent benefit assessments (lines 13-14)"? (And what does the term "benefits" mean here?)		
61.	Pg. 35, lines 17-24. And the public can use expanded methods to educate EPA about the value of ecosystem protection. This "education" is a two-way enterprise.	Slovic	Change language to indicate the two-way nature of communication/education
62.	P37, 112-15--Later in the valuation process, EPA will need to use ecological production functions to generate more detailed analyses of key interactions, specific ecological responses to EPA decisions or actions, and resulting consequences to ecosystem services. using ecological production functions.	Daniel	Make change

Chapter 3

1.	p. 37, line 9: Because the conceptual diagram does not enter into policy decisions, it is misleading to say that it is "essentially a decision tool;" it can be said that it is "essentially an orientation tool to help..."	Ascher	Will do
2.	Page 39 line 8, should be section 5.3 (not 5.1).	Bostrom	Make change
3.	Page 40, lines 18-20. I hate to bring this up but... The definition of an ecological production function has been a subject of some discussion in the past, and I agreed to the current definition/use. However, to say that "the relationships between ecological inputs and outputs" is the same as "between the structure and function of ecosystems and the provision of ecosystem services" is problematic because ecologists would rarely if ever define ecological inputs as the structure and function of ecosystems. Ecological inputs would be sunlight, precipitation, atmospheric deposition, pollution inputs, human disturbance, etc. These inputs in	Pitelka	Change language to read "Ecological production functions are similar to the production functions used in economics to define the relationship between inputs (e.g.,...) and outputs of goods and services. Ecological production functions describe the relationships between the structure

	<p>turn determine ecosystem structure and function, and changes in the inputs alter structure and function. Going back to the analogy with economics, the more conventional definition of inputs seems to correspond with the economic inputs. The equivalent of ecosystem structure and function would be the economic system that exists in an area, not the inputs that support it.</p> <p>I believe fixing this should be easy. NOTE that on page 59, line 4, the text uses “ecological responses”, not “ecological inputs”.</p>		and function of ecosystems (in response to EPA actions) and the provision of various ecosystems services.”
4.	<p>On page 41, the Report says, “Scientists are making rapid progress in understanding and defining ecological production functions for certain ecosystem services. One such service is pollination.” For this it cites “Kremens et al., 2007”; “Greenleaf and Kremens, 2006”; and “Ricketts et al., 2004.” None of these papers appears in the bibliography. No relevant papers by “Kremens” occur in the scientific literature.</p>	Sagoff	Clarify text and references in light of input from Claire Kremens
5.	<p>p. 41, line 24: at least one word is missing at the end of the line</p>	Ascher Freeman	Add word “forest” at end of sentence
6.	<p>Page 41, line 24. I think the word “forests” is missing from the end of the line.</p>	Pitelka	Make change above
7.	<p>P41, L24--...fairly accurately quantify above-ground carbon stores in various types of ecosystems such as forests...</p>	Daniel	see above
8.	<p>P42, L5-6--Characterizing of the ecology of the system • Identifying of the ecosystem services of interest</p>	Daniel	Make change
9.	<p>Page 43, Figure 3. The bottom oval on the left should be “Global level”. “Global-change” is an apple. “Individual level”, “population dynamic” (level), “community level”, and “ecosystem” (level) are oranges.</p>	Pitelka	Make change
10.	<p>p. 46, line 1: “mean” instead of “means”</p>	Ascher	Make change

11.	I don't see any discussion of the difficulties in predicting changes in ecosystem service flows where systems are dynamic and have non-linearities. I remember providing language about this issue.	Freeman	See point immediately below
12.	On rereading section 3.3.1 (pp. 43-47), I'm not sure that anything more needs to be said here. It mentions dynamics twice and non-linearities once. And it includes the cite to Fox (Science, 2007) on novel ecosystems with no current analogs (I suggested that cite last summer). It would be enough for me just to add a cite to Dasgupta and Maler (2004) at p. 45, line 14 where non-linear responses is mentioned. Dasgupta, Partha and Karl-Goran Maler. 2004. _The Economics of Non-Convex Ecosystems_, Dordrecht, Kluwer Academic Publishers.	Freeman	Include Dasgupta and Maler citation
13.	Page 46 line 22 edit “advises” to read “encourages”	Bostrom	Retain “advises” because advice is business of committee
14.	P51, L11-- ... of measures ..	Daniel	Make change
15.	P52, L1--... not outputs of direct human importance.	Daniel	Make change
16.	Page 51, line 21. This subtitle is potentially confusing. It sounds like it is saying “Mapping the responses of ecosystems to ecosystem services” which is the opposite of what it means. Perhaps the subtitle should be “Mapping from ecosystem response to changes in ecosystem services”.	Pitelka	Make change
17.	Page 52, lines 7-9, this still raises the concern for me that if proxies are used in other ways in the valuation process, they may be misleading.	Bostrom	Change sentence to “using ‘indictors’ that are correlated with ecosystem services and using meta-analysis.”

18.	Page 52, line 15. Here again the word “inputs” seems to be used inappropriately. Given our definition of ecological production functions as steps 2 and 3 from the top of page 40), this should be “Indicators”, as the term is used here, are measures of key ecosystem properties whose changes...” The indicators that have been identified by the NRC and the Heinz Foundation are ecosystem properties, not ecological inputs. NOTE that on page 59, line 4, the text uses “ecological responses”, not “ecological inputs”. Ecological responses are changes in ecological properties.	Pitelka	change language to “are measures of key ecosystem properties”
19.	Page 53 line 24, add here a reference to the Chicago Wilderness report card, which does a similar thing (available at http://www.chicagowilderness.org/pubprod/index.cfm). Could even use the Chicago Wilderness report preferentially, since that would help integrate the overall report a little more.	Bostrom	Add reference
20.	Page 57 line 12 – missing citation?	Bostrom	<p>Insert citations provided by Paul Risser: Suter, G.W II and G.W. Suter. 2006. Ecological Risk Assessment. CRC Press. Chapter 6 is on scaling and Steve Bartels' Chapter 28 discusses scaling and ecological modeling for assessing ecosystem effects.</p> <p>Turner, W.R., K. Brandon, T.M. Brooks, R. Costanza, G.A.B. de Fonseca and R. Portela. 2007. Global conservation of biodiversity and ecosystem services. BioScience 57(10): 868-873.</p>

21.	Page 57, line 12. I am responsible for this statement but am not sure of a suitable reference. I know that the EPA STAR program has funded such work.	Pitelka	Ask EPA STAR program if they know of a potential citation.
22.	p. 58, line 6: separate the words “link” and “the”	Ascher	Will do
23.	Pg. 58, lines 26-29. Shouldn’t public input also be solicited to identify relevant services?	Slovic	Lines 22-25 already address getting public input to identify relevant serves. The bullet here addresses measurement methods.

Chapter 4

1.	Page 61 chapter 4 - reference the methods appendix earlier?	Bostrom	Will do
2.	P. 61, lines 15 -18. (circled section 6.2 and 6.3) – marginal note “why do they have to be accorded a central role or primary.” I have big problems with proposal to make non-economic methods have a central or primary role. This is again an effort to restore balance. There is no reason to say economic can be ignored implicitly when turning to non-prescribed decision contexts.	Smith	Change sentence to “...can play a larger role in analysis (see...”
3.	P61, L12-15-- .. monetized valuations must be based on appropriate economic methods. Other valuation methods can still provide useful information in this context, but the role of these methods is limited by the need to follow the guidance in the circular (see section 6.1).	Daniel	Make change
4.	Pg. 61, lines 12-20. Regarding prescriptions of OMB Circular A4, we should protest the limited role afforded non-economic methods and call for high-level critique of the OMB circular. [Note , I later saw in Section 6.1, a broader interpretation of the OMB Rule. That broader interpretation seems missing in this Chapter 4 section.]	Slovic	As discussed in teleconferences, this goes beyond the role of the committee.

5.	p. 61, line 30: What is a “sound” scientific basis for a method’s use?	Freeman	Change sentence to “if there is a scientific basis...”
6.	Pg. 62, lines 7-10. “urges” sound weak. How about saying the committee believes it is necessary for EPA to develop criteria etc.?	Slovic	Change “urges” to “advises” (see earlier discussion of appropriate SAB terminology).
7.	Pg. 64, line 3-4. This important point is relevant to a concern I have about mediated modeling (see my reference to the text on pg. 114)	Slovic	No change requested
8.	Pg. 64, line 18-21. Many studies have shown that willingness to pay measures often fail to meet this construct-validity criterion, see e.g. Desvousges et al. (1993). Measuring natural resource damages with contingent valuation: Tests of validity and reliability. In J.A. Hausman (Ed.), Contingent valuation: A critical assessment. Amsterdam, North-Holland.	Slovic	Individual methods are not critiqued in Ch 4. no change envisioned
9.	p. 65, line 6: no need for a reference here.	Ascher Bostrom	Correct
10.	Page 66-67 - Would like to see mental models included in this table. Please consider adding the section described at the top of my comments, and adding in a line for mental models research explicitly in Table 2, either under measures of attitudes, (beliefs), preferences and intentions, or under decision science approaches. Measures of beliefs are a critical design tool for the valuation process.	Bostrom	Will not add b/c not a valuation method per se
11.	p. 66-67, third column. changes to text in blue “Monetary measure of WTP for ecosystem services that affect decisions to visit different locations “Hedonic pricing “Monetary measure of marginal WTP or willingness-to-accept (WTA) as revealed by price for houses or wages paid for jobs with different environmental characteristics and prices Indicated problem with referenda and initiative language but no new language	Smith	Make changes for travel cost and hedonic pricing For referenda and initiatives, change language to “Community-based values; indicator of economic value under some conditions.

	Indicated disagreement with characterization of cost as a proxy for value. Circled third column, page 67. Did not provide alternative language: “Disagree with characterization especially Habitat Equivalency – not an economic value”		For Habitat Equivalency, change language to “Bio-physical value; not economic value except under some very limited conditions”
12.	P68, L6-7--... ranked based on individual or aggregate indicators for use in evaluating policy options based on biophysical criteria previously determined to be relevant to human/social well-being .	Daniel	Make change
13.	P. 68, line 15: “health” of ecosystem is a problematic concept, controversial among ecologists.	Freeman	Change language to: “can be assessed in terms of the calculated effects on the ecosystems”
14.	P69, L11-12--These methods can provide estimates of the ecological cost of producing a given good or service based on required inputs.	Daniel	Drop last sentence of paragraph. Keep footnote 29.
15.	P. 69, lines 11-12: ecological footprint provides estimate of cost of production? How?	Freeman	See immediately above.
16.	P. 70, lines 10-11: Why is Ayres and Kneese cited regarding embodied energy. I don’t recall them talking about this.	Freeman	Check with Bob who provided reference
17.	Page 71 line 21 missing year in the reference. Should be 2000.	Bostrom	Correct
18.	P71, L35-36-- ... of users of a service (e.g., water or recreation) within a given area, and the distance to the nearest vulnerable (ecological or human?) community.	Daniel	Add the word “human”
19.	p. 72, line 18: Change “There are a variety” to “There is a variety”	Ascher	Will do
20.	p. 73, line 2: Word missing between “related” and “ecosystems”; probably “to”	Ascher	Make change

<p>21.</p>	<p>Page 73 lines 17-19: This is the only place in this chapter where anything much is said about beliefs. I suggest adding in the section proposed above, after this section. Move lines 17-19 to the new section.</p> <p>Insert text on mental models adding to the current closing sentence in the third paragraph is taken from page 73, lines 17-10:</p> <p>Valuation methods assume an informed public or a well functioning market, which in turn assumes informed choices. One structured approach to assessing how informed people are about the consequences of specific decisions and their decision-relevant beliefs is a mental models study. How people understand relevant causal processes - that is, in this case, their mental models of ecological services - can be critical to their judgment of the outcomes and effects of environmental programs, and influence their preferences among alternatives.</p> <p>Mental models studies for risk communication explicitly compare causal beliefs with formal decision models in a three-pronged research process (Morgan et al, 2002). First is the construction of an expert decision model, generally through systematic, formal decision analysis involving scientists and other topical experts, individually or in groups. Following this is the analysis of semi-structured interviews with individuals from the population of interest, and comparison of these to the decision model. Third is the design and fielding of a survey to test the reliability of findings from the interviews in a representative sample of the population of interest or the public at large. The interviews and surveys employ mixed methods, and assess both how decision makers intuitively structure and conceptualize their environmental mitigation decisions, as well as how they react to structured stimuli and questions.</p> <p>Mental models research has been used to characterize mental models of hazards underlying a variety of environmental decisions, for example mitigating risks from climate change (Bostrom and Fischhoff, 2001; Bostrom and Lashof, 2007; Bostrom et al., 1994; Böhm and Pfister, 2001; Kempton, 1991, 1997; Lazo et al, 2000; Löfstedt, 1991; Read et al., 1994; Tschakert, 2007). Rigorous</p>	<p>Bostrom</p>	<p>Insert text in the general vicinity.</p>
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	<p>qualitative analyses of transcripts from individual narratives or focus groups can also expose subtle differences in individual beliefs and perspectives and the inferential bases of participants' values.</p> <p>Studies of mental models can usefully inform the design of concept maps for ecological models underlying valuations, to insure public understanding of endpoints, the design of valuation surveys, and the design of communications about ecological valuation.</p>		
22.	P73, L29-30-- ... useful in the early stages of designing a survey to elicit value information from a broader representative sample of the relevant population.	Daniel	Make change
23.	p. 74, line 8: Change "sue" to "use"	Ascher	Will do
24.	<p>P74-76 citations</p> <p>Survey questions about ...</p> <p>Bishop & Rohrmann 2003, move to Behavioral observation section</p> <p>Gimblett, et al. 2001, move to Behavioral observation section</p> <p>Wilson 2002, delete (unlikely readers will want to read this whole book, next reference covers it)</p> <p>Individual narratives ...</p> <p>Nisbett and Wilson 1977, delete</p> <p>Behavioral observations</p> <p>Brandenburg & Carroll 1995, move to Individual narratives section</p>	Daniel	Make change
25.	Pages 74-75 - R.K. Merton's work on focus groups should be cited here. For example: Merton, R.K., Fiske, M., & Kendall, P.L. (1990). The focused interview: A manual of problems and procedures. (2nd ed.). London: Collier MacMillan.	Bostrom	Insert on p. 75

26.	P.76, L 26-27 “An ecological change improving a resource that an individual values will increase...” “The marginal value or econ benefit...”	Smith	Make change
27.	P. 77, lines 1-2 “economic valuation may yield value estimates” Circled sentence “many view this as a drawback in the context of public policy decisions” and provided marginal note “why”	Smith	Make change in first sentence. Explain second sentence.
28.	P. 77, line 16: Add: “These methods have been used to assess the welfare effects of a wide variety of public policies, for example, economic regulation and the elimination of tariffs. P. 77, lines 32-33: Delete this reference. It does not describe market-based methods. p. 77, line 29: The correct title is “Valuing the Environment as A Factor of Production.”	Freeman	Make changes
29.	p. 78, line 6: delete comma after “including”	Ascher	Will do
30.	Page 77, further reading. Include Freeman and remove Winston	Smithb	Make change
31.	p. 78, line 8: Change “pay for houses with...” to “pay for houses or other directly-purchases items with...” This is warranted by the fact that hedonic pricing can be based on prices other than just homes—e.g., one can calculate the value of safety by doing a hedonic analysis on car prices.	Ascher	Will do
32.	P. 85, section 4.2.6: mention facilitator effects in this section?.	Freeman	Will insert text in Chapter 4 noting facilitator effects in any case where someone actively elicits the values of another.
33.	Pg. 86, line 39. Gregory, Lichtenstein, & Slovic (1993). “Measuring environmental values: A constructive approach” belongs here.	Slovic	Add citation

34.	P. 88, further reading – add Bartik, 1988 JEEM article	Smith	Add reference
35.	P89, L 20—The price of tradable emissions permits under cap-and-trade systems will almost ... {Assuming this intended to be a new method, separate from HEA.}	Daniel	Will do
36.	P. 90, line 3: “Blackbird” and “Mine” should both be capitalized as proper nouns.	Ascher	Will do
37.	P. 91, L 13. Need to be specific. circled “added assumptions the analyst is prepared to make” and made marginal notes “preferences and supply conditions the application which amount to”	Smith	Will talk with Kerry Smith for clarification and suggestions for possible new language.
38.	P91, L22--... the economic benefit-cost analysis of the CAFO regulations offer .	Daniel	Will do
39.	P. 91, L93, replace “values” with “services”	Smith	Will do
40.	p. 98, line 1: “set of criteria is” rather than “set of criteria are”	Ascher	Will do
41.	P99, L9-10--The valuation approach proposed in this report calls for EPA to allow for the use of a broader suite of methods than EPA ...	Daniel	Will do
42.	P. 99, L. 16 Don’t single out citizen juries for profiling	Smith	Delete “(e.g., citizen juries)”
43.	P. 99, it says: "The valuation approach proposed in this report calls for EPA to allow for the use of a broader suite of methods than EPA has typically employed in the past for valuing ecosystems and their services." This implies that the methods are different ways of measuring the same thing. They are not.	Freeman	See response to Chapter 2, point 57.
44.	Pg. 99, line 12. Again, what does experiment mean here. Experiment seems to be used throughout as a put-down, a relegation to second-class status. Is there any method so well established that it does not need further testing, evaluation, and refinement? Results of an experiment are unlikely to make it into “prime time” on the decision maker’s agenda.	Slovic	See response to Chapter 2, point 57

45.	P. 99, L 28-29. not sure what this means	Smith	Clarify sentence.
46.	P. 99 – Conclusions from chapter not bulleted	Segerson	Bullet conclusion
47.	p. 101, lines 4 and 5: commas instead of semicolons.	Ascher	Will dop
48.	Provide a reference to survey Appendix at end of Chapter 4	Daniel	Will do
49.	I regret the choice not to include some effort at critical assessment for each of the methods included in Section 4. "Methodological pluralism" is not the same thing as "anything goes."	Freeman	Too late to undertake major new analysis.