

ATTACHMENT C3

Compilation of SAB Comments on the EPEC Eco-Research MYP

(Ver. 7-28-2008)

**1. Dr. Deb Swackhamer (Lead Reviewer)
Quality Review: Advisory on EPA Ecological Research Program Multi-Year Plan**

The review of the Ecological Research Program's MYP does a clear job of lauding the aspirational goals of the Program while thoroughly describing the challenges for meeting these goals. The Program was reviewed by SAB Ecological Processes and Effects Committee (EPEC), which provided a rich array of specialties and perspectives. The report is generally well-organized and well-written, with a few exceptions noted below.

- a) Adequacy of addressing charge questions: The Committee was presented with 6 charge questions, and did a very thorough and thoughtful of responding to them.
- b) Draft report is clear and logical: In general, the report is extremely well-written, very clear, and very well organized. The recommendations are easily found due to the use of bullets, and they are clearly articulated as recommendations. The report is very clear about when the Committee was unanimous, or when there was a diversity of opinion. The Committee is commended for referring to specific pages in the MYP to map their discussion back to the Plan (eg p 19 line 39, p 20 line 41).
- c) Conclusions and recommendations are supported by information in the body of the report: In the main body of the report, the conclusions and recommendations were well supported by the discussion and other information. However, there were several sections of the Executive Summary and the Letter to the Administrator that were not clear without referring to the main report. I had some trouble clearly mapping the bulleted recommendations from the Letter to the Executive Summary and main body of the Report; they seem too vague and therefore ineffective as stand-alone recommendations. In the Executive Summary, the first two bullets on page ix are difficult to understand, particularly the reference to outreach and education in both. On page viii, line 5, the "certain areas" should be articulated as they are later in the report.

The discussion of Long Term Goal 3 on page x of the Executive Summary lacks some consistency with the full text discussion of this LTG. The Committee expressed concerns over the choice of nitrogen as a focus rather than another element, for example. The Executive Summary implies that the

Committee endorsed the focus of LTG 3, when in fact that does not appear to be the case.

I did not find Figure 1 (page 26) useful.

Specific comments:

- P viii, line 5: the word “logic” can be confused with the use of this word later in “logic model”, and might be changed to “rationale”.
- P viii, line 7: STAR should be spelled out and then the acronym used for the rest of the document.
- P viii, lines 22-3: the phrase in () is awkward.
- P xii, line 19: ORD should be spelled out and then the acronym carried forward.
- P 5, lines 19-20: NCEAS is referred to here but should be cited; it is in the references, and is cited elsewhere.
- P 16, line 38: P should be spelled out.
- P 24, line 26: comma needed after “not”
- P 30, line 6: remove extra period.
- Page 32, lines 17-18: need a space between these two references
- Page A-10: lines 14 -19 and lines 27-32 are nearly the same

2. Dr. Mike McFarland (Lead Reviewer)

The SAB Ecological Processes and Effects Committee (Committee) is commended for providing a clear and unambiguous report summarizing their scientific review of the Office of Research and Development’s (ORD) Ecological Research Program Multi-Year Plan (Plan). The letter to the administrator is well balanced and highlights the salient findings of the Committee’s scientific assessment. Similarly, the Executive Summary provides a detailed synopsis of the Committee’s full responses to each of the Agency charge questions with each response followed by concise descriptions of specific recommendations. Given the quality of the Committee’s responses to Agency charge questions, I fully support approval of the report pending any modifications/revisions agreed to by the SAB.

Although the Committee, in principle, supports that the strategic direction of the Agency’s Ecological Research Program Multi-Year Plan as well as its conceptual framework, it has a number of serious reservations regarding the Plan’s ability, as currently described, to generate the information necessary for reaching scientifically defensible decisions. The Committee acknowledges that many of the Plan’s technical limitations are associated with its proposed implementation program as well as the acute lack of funding and absence of vital in-house Agency expertise. The following section provides specific responses to the quality review charge questions followed by supplemental observations presented for consideration by the Committee.

Were the original charge questions to the SAB Panel adequately addressed in the draft report?

The Committee is applauded for providing clear, concise and detailed responses to each of the Agency charge questions. In each of the Committee's responses, a bulleted list of specific recommendations was provided for Agency consideration. It is particularly gratifying to note the Committee's strong support for the need to align ORD's ecological research program with the Agency's ecological risk assessment goals.

Is the report clear and logical?

On the whole, the report is clear and logical. However, there is one statement that is repeated both in the Executive Summary (page xii lines 23-24) and in the body of the report (page 9 lines 17-19) that is confusing. The Committee suggests that ORD "consider a non-Western value system most notably that of Native Americans to ensure that well-being is parameterized in an accurate multidimensional manner".

Although I believe that I understand the intent of the Committee's statement, I am not entirely convinced that it is appropriate. At best, the statement is fraught with confusion particularly to a reader unfamiliar with Native American culture and, at worst, the statement could be misinterpreted as patronizing (or at least judgmental). In my opinion, the degree to which Western value systems and Native American value systems diverge on the importance of ecosystem services is not sufficiently defined in the body of the report to merit inclusion of this statement.

Where the conclusions drawn and/or recommendations made supported by information in the body of the draft report?

The conclusions/recommendations articulated by the Committee are fully consistent with information found in the body of the report. The Committee has highlighted the need to address a number of overarching program limitations specifically the lack of sufficient program funding as well as the absence of requisite expertise in ORD to fully execute the Plan. The Committee is applauded for its support of ORD's decision to pursue financial leveraging opportunities both within and outside the Agency for funding vital ecological research as well as its acknowledgement that a sustainable ecological research program requires investment in the training of future scientists through an extramural grants program.

SUPPLEMENTAL INFORMATION

- a) Page 4 (line 34). Should the sentence that begins with "A 10-year plan ..." be rewritten to state "A 5-year plan ..." since multiyear plans have a five (5) year time horizon?
- b) Page 9 (line 11). Should the word "physical" be placed in between ORD and scientists to distinguish physical scientists from social scientists?

- c) Page 12 (lines 14 – 18). What is the current or potential role of the Agency’s Office of Information with respect to outreach and education (OE)?
- d) Page 12 (lines 41-42) There are a number of other federal agencies that maintain and have jurisdiction over large tracks of land (terrestrial ecosystems) including the US Dept. of the Interior (Bureau of Land Management), US Dept. of Agriculture (US Forest Service) and US Dept. of Defense (test and training ranges). Each of these agencies (as well as others) is required to conduct ecological assessments (as mandated under the National Environmental Policy Act or NEPA) of the property under their management. These federal agencies also support well funded ecological research programs whose activities may be leveraged by the ORD.
- e) Page 24 (lines 10 – 11). The statement that begins “We find that this amount (1%) is insufficient to support effective outreach efforts...” should be revised to reflect the fact that this statement is an opinion and not the result of an actual cost analysis.
- f) Page 27 (lines 39-42). The Committee should consider adding Interagency Personnel Agreements (or IPAs) to this list. IPAs allows government employees (local, state or federal) with specific skill sets to be detailed to ORD (or other EPA offices) to meet program needs.

3. Dr. Catherine Kling (Lead Reviewer)

Comments on the SAB Advisory on the EPA Ecological Research Program Multi-Year Plan

This report is very clearly written and entirely responsive to the charge questions. The report is logical and the conclusions drawn are supported by the information in the body of the report. The message that EPA is entirely on the right track with its new focus on ecosystem services comes through loud and clear; this is an important and clear message that the committee has done a great job at delivering.

A general comment: one of the tensions in considering a research program like the one presented here is to cut the right balance between undertaking the research that answers the right questions for a particular decision that must be addressed (which suggests waiting until those questions are clear and then formulating a specific research project) vs. having a set of ecosystem values sitting on the shelf waiting for use when a decision need arises. In the latter case, the values that will be “on the shelf” will no doubt not quite fit the research question. And, it is these values that are most likely to be misinterpreted or misused. In the former case, the analysis needed will often be too slow to be of use in making the decision. (Related to this point is the need to avoid valuing ecosystem services just for the sake of doing so; indeed, many decisions related to ecosystems will not need formal valuation to support good decision making. In other cases, explicit valuation will be a very

key input to a decision process.) The Ecological Research Program at EPA somehow needs to do their best to balance these two competing needs (easy to say, hard to do).

- a) On page 5, the committee provides a fantastic suggestion: that EPA should collaborate with other federal agencies and scientists to conduct an assessment of status and trends of ecosystem services in the U.S. (they draw an analogy to the IPCC). This strikes me as a very valuable enterprise for which EPA should obviously be the lead. Further, this could be a significant component of the effort to intelligently leverage EPA (and other agencies and NGOs) resources in this important area. Two suggestions: 1) make this recommendation more prominent by adding it to the Executive Summary and possibly the letter to the Administrator and 2) to mention this idea again in the report in reference to the section and discussions related to leveraging of EPA resources on ecosystems research.
- b) The entire issue of how best for EPA to develop and support decision support platforms has been a continuing struggle in the ecosystems research area. I wonder if it might be useful for EPA to examine in depth one or more DSPs that have been developed and implemented by other agencies (or by EPA in another area?) to learn what approaches have been effective both in terms of model and data and in terms of the delivery of the DSPs to the end users. Are there DSPs related to superfund sites? There is a large multi-state, multi-agency effort to restore the Chesapeake Bay, are there DSPs that have been developed in that effort? Have they been effective? What can be learned from them (positive or negative)?
- c) Thank you for noting that “biofuels” are not the only environmental issue in the 13 state region of the Midwest (page 19)
- d) There is discussion r.e. Charge Question 5 on the new NRC report on evaluating research efficiency at EPA. While I assume that the NRC report deals with the “PART” process that has been such a thorn in the past, I was not clear whether the recommendations provided by the SAB review on page 25 were based on the NRC report and/or whether they would be consistent with being successful in whatever PART-like process will evaluate the ecological research program in the future. While I think the comments provided in the SAB review are very sensible, I just want to be sure that SAB is not suggesting things that will later be problematic (e.g., is the point that it is “premature to prescribe specific measures to evaluate annual performance/progress goals for the program” (lines 34-35, page 25) going to be a problem for EPA later?)

- e) Very minor point: there is an occasional monster paragraph in the report that makes reading the manuscript a bit more daunting than necessary. See pages 8 and 13 for examples.

This was an extremely thoughtful and thorough report.

4. Dr. Virginia Dale (Lead Reviewer)

5. Baruch Fischhoff

My reading of the draft report and review raises the following concerns:

The Decision Support Platform is likely to be a waste of money, diverting limited resources from ecological research to expensive computer exercises that bring little value to anyone but their developers, unless the following issues are addressed:

- (a) Members of an explicitly identified user community must be involved in all stages of its development, so that the DSP has some specific uses and not just an ill-defined set of conceivable uses.
- (b) The DSP is subjected to rigorous empirical evaluation of its usability, with individuals drawn from that identified user population, performing tasks like those for which the DSP is intended. These evaluations must meet the highest standards of human-computer interaction research and, as mentioned, begin with the earliest stages of system development – so that usability is essential to the design, not an afterthought tacked on at the end.

The draft review raises very serious concerns in this regard (p. 9ff). To my mind, it is not skeptical enough. As the authors note (quoting Goosen et al., 2007, on p. 41), the general problem of creating useful DSP's has not been solved. It takes a leap of faith that a few additional suggestions will do the trick, and justify this investment. I am not convinced that the program's stated goals would not be better served by investing its resources in sound research, with enough set aside to ensure that they are communicated effectively to decision makers (a belief that may underlie the draft review's concern about the minimal education and outreach budget). One can support decisions without decision support systems.

The commitment to assessing the value of ecosystem services is commendable. However,

- (a) As the draft review notes, the lack of resources makes the realization of this commitment infeasible. Not only is the NCEE underfunded as is, but the SAB has heard a proposal to eliminate it. This report could be very useful if it led to strengthening the NCEE, not so useful if it added an additional demand to a threatened common pool resource.

- (b) The report appears to be open to non-economic methods of valuation (as will be summarized in the SAB C-VPES report that it cites on p. 31. I would like to see that openness made more explicitly. Monetization can serve some purposes (e.g., in regulatory proceedings). However, there are other contexts (e.g., community planning, restoration, communication, education) where it can be a distraction. Moreover, as the report notes (Section 1.2.3), there are situations in which it is hardly viable. Requiring monetization implicitly devalues those resources that economics does not yet know how to handle.

I am skeptical of any Outreach and Education activities without explicit empirical evaluation. I see unconscionable amounts of resources wasted on what seem like useless (even counterproductive) websites, PSAs, etc. People naturally exaggerate how well they understand their audience and how well they have communicated. There is no substitute for evidence – which must be collected to social science standards (i.e., not just web hits or TV views). Partnering solves nothing unless the partners have sound practices.

It seems strange that a report on ecosystem health would have only one reference to invasive species. It is also my sense that the activities proposed here move at too slow a pace to facilitate EPA's response to invasives. Rather, these activities may just serve the forensic purpose of documenting the damage that invasives have done (perhaps in terms). If so, then, with its limited budgets, EPA may be choosing comprehensiveness over effectiveness. The report may envision some (unspecified) others picking up the action. However, I didn't see the explicit plan and resources to make that happen. (The draft review discusses these issues in more general terms in its answer to Charge Question 3, and elsewhere.)

Generalizing this last point, I had the feeling that there was relatively little ecology in the report, given the program's mission, outside the two case studies (and, to a lesser extent, the wetlands and coral reef sections). Rather, the plan seems to emphasize data management and highly selected chemical threats. That makes me wonder whether the Agency's scientific resources in ecology have been depleted and the report is written to take advantage of the capabilities that it has left, rather than pushing for strengthening of its resources in ecology. Continuing my first two worries, I wonder whether the systems being proposed (DSP, valuation, etc.) will be able to accommodate the broad range of ecological knowledge, or just variables that appear across places and scales (just as I fear that they will not be able to accommodate the broad range of human concerns).

Overall, my inclination would be to build out from case studies, ensuring that they are addressed adequately, with an eye to developing general methods – rather than assuming that a general method exists, investing a lot in its creation, and then hoping that it can be applied. Decision makers (broadly defined) might be best served by having someone else's, perhaps very different, problem solved well, so

that they can see what a full solution looks like.

6. Dr. Rebecca Parkin

The charge for an SAB quality review asks whether:

- a) the original charge questions to the SAB EPEC are adequately addressed in the draft report;
- b) the draft report is clear and logical; and
- c) the conclusions drawn, and/or recommendations made, are supported by information in the body of the report.

My responses to the above questions are:

- a) Nearly all of the charge questions were addressed adequately. The responses to Questions 1 and 3-5 are adequate. The responses to Charge Question 2 are more difficult to assess because the organizational structure of the report does not go down to the level of the elements within the bulleted questions. While the goals were clearly addressed for Long-Term Goals (LTG) 1 and 4, they were less obviously considered for LTGs 2, 3, and 5. The objectives for LTGs 1, 2, and 4 and the research questions for LTGs 1 and 2 were explicitly discussed. Elements within each of the bulleted questions seem to have been missed in part for each of the LTGs.
- b) Other than the comment in a), the draft report was clearly written. Throughout it was written in a logical manner.
- c) The conclusions stated in the letter to the Administrator, Executive Summary (ES) and report were supported by evidence presented in the report. Many points made repeatedly in the report (e.g., limited resources, lack of internal expertise, need to develop partnerships) were stated in the letter and/or ES. However, there are points of urgency or emphasis in the report which were not noted in the letter and/or ES. These discontinuities may be readily addressed in a variety of ways (e.g., rephrasing, ensuring consistency in capturing major points in the ES and the most urgent and important points in the letter). Examples of mismatches between the report and the letter and/or ES include the following:

- Pages 10, 17, 18: The need to obtain “buy-in” from stakeholders and partners is repeatedly noted and stated as “essential” in the report, but this need is not stated either in the letter or ES.
- On various pages (e.g., pp. 12, 21 and 29) outreach and education (O&E) are noted as elements of the plan, but functions for which ORD has little expertise. It is curious to this reviewer that, if this issue merits repeated mentions, there is no mention of O&E in the letter and only a brief listing of this issue in the ES. Further, the importance of ensuring an empirical basis for O&E has often been stressed by the SAB, but is not mentioned in the report (p. 29). This reviewer sees this omission as a key, missed opportunity for reinforcing this important point.
- Defining ecosystem services too narrowly, and thereby overemphasizing human health and welfare goals, is raised as an

important issue (p. 13, line 38 through p. 14, line 4), but it is not noted in the letter or ES. Without bringing this concern forward to at least the ES, it appears to this reviewer that the committee does not see this issue as important as the text implies.

- The committee notes that understanding why ecosystem services are lost is a “key missing piece,” which is crucial to the overall success of the plan (p. 18). However, this point, which is emphasized in the report, is not mentioned in the letter or ES.
- Selecting sites which are widely representative and offer the opportunities for generalization to other areas is noted as important (page 19), but is not stated in the ES or letter.
- Another issue which is addressed repeatedly in the report (e.g., pp. 15, 19, 20 and 23) is the importance of ensuring that the scale of measurements is appropriate for the decision problem and that that scale can be adequately characterized using available data. This issue is not stated in the ES or letter.
- Is “as soon as possible” the correct meaning on p. 15, line 13? If so, shouldn’t this issue be noted at least in the ES?
- The question raised asking why ORD has chosen to focus on N instead of P (p. 16) seems important enough to merit mention in the ES.
- The use of life cycle analysis is “strongly urged” by the committee (p. 20), but only in the report.
- On pages 23, 24 and 30, the point is made that ORD should enlist the support and input of potential partners “immediately” and “as soon as possible.” This need for early action, if it is what the committee as a whole intends, is not expressed in the letter or ES.
- A “tremendous opportunity” to advance ecological research is noted on p. 24 only. If it is so significant, this reviewer would expect to see it at least in the ES as well.

Additional comments to consider:

- Two acronyms are used before they are defined (e.g., ORD and STAR).
- Some acronyms are defined but are not used again in the report after being defined (e.g., NRDAR, LTER and ERA).
- Some portions of the report (e.g., page 7) become tedious to read due to heavy use of acronyms.
- P. 1, line 24: This reviewer recommends deleting “understand” as it is not measurable, but “respond” is if it is assessed in terms of specific types of response.
- Combining types of information and functions are described as “quite dangerous” (p. 11) in the report, but are not highlighted elsewhere. This reviewer wondered whether this description fits

the committee's actual intent or whether rewording would be more appropriate.

- Wherever 1% is pointed out as insufficient for O&E (e.g., pp. 21 and 24), a means to determine what would be a sufficient percentage should be indicated.
- This reviewer questions the appropriateness of calling upon ORD to work with organizations to "raise funds" (p. 28).
- This reviewer does not agree with the first bullet on page 29, suggesting that ORD leverage universities by getting them to accept reduced indirect costs. In this era of reduced federal funding, many universities are not able to offer such options. Federal agencies are usually some of the few places where universities CAN get full indirects. Most other funders (e.g., foundations and not-for-profits) do not allow full indirect cost recovery.

7. Dr. Agnes Kane:

I concur with the Committee's review of this draft plan. This review was thorough and thoughtful and provides clear guidelines for revision. As a physician, I support the committee's first suggestion to place greater emphasis on the relationship between ecosystem services and human health and well-being. This should be considered at multiple levels: individuals (especially susceptible individuals), local communities, and the entire population. Specific case studies or examples should be developed to illustrate potential or demonstrated human health impacts at each of these levels.

Outreach and education is an important issue that applies to all Agency environmental programs. Other community and education outreach programs have been developed by external funding mechanisms (e.g., SBRP Grants and NIEHS Center Grants). EPA should consider utilizing the resources and expertise that have already been developed by these funding mechanisms.

8. Dr. Jana Milford:

My review of the draft report raises the following concerns.

a). It is not clear to me that the first charge question has been adequately addressed. This charge question asks specifically if the proposed strategic direction will offer "meaningful contributions to the ecological sciences" and provide "research that will be useful to decision makers at EPA and other levels of governance." The question of how the Agency's proposed focus on ecosystem services will contribute to/fit in with the broader field of ecological sciences seems an especially appropriate subject for SAB comments, yet it is barely addressed in the report. In particular, I expected the panel to discuss the opportunity costs of the proposed focus (and the apparent shift away from EPA ORD's prior focus on ecological risk assessment). Does the strategic direction still accommodate necessary research in monitoring ecosystem status? Does the utilitarian focus of "ecosystem services" risk losing important potential research

contributions to improved understanding of ecosystem functions/responses that are unrelated to recognized “services” to human health and well-being? Similarly, is there a risk that over-emphasis on ecosystem services that are too narrowly defined will prove to be a disservice to decision makers in the long run? The panel might consider these questions and nevertheless conclude they enthusiastically support the new direction, but I wish the broader questions could be addressed.

b) The very first recommendation on p. viii of the Executive Summary suggests that resources are inadequate to accomplish the goals of the research program and urges EPA to provide STAR grant support for ecosystem services. This may be a rather off-putting start to the Committee’s report, since it could be perceived as self serving. The Committee might reconsider the placement of that recommendation, and also consider whether there are other ways to fill the needed research/capacity gaps (e.g., new hires at ORD with increased in-house research, contracting out work to consulting companies, etc.).

c) On p. xi and p. 16, the Committee advises ORD to eliminate its proposed research focus on coral reef ecosystems under Long-term Goal 4, because coral reefs “are a relatively low priority in the U.S.” This statement is not supported by any evidence, and moreover seems rather narrow-minded. EPA has historically had and arguably should continue to have an important role in research and policy development related to “globally important” environmental problems. But perhaps instead of making value judgments about whether coral reef ecosystems are an important U.S. priority, the Committee might ask ORD for a better explanation of how studying the dynamics of ecosystem service flows in coral reefs will advance ecological sciences and ultimately help inform decision making.

d) On p. xi and p. 20, the Committee needs to explain more clearly why consideration of “transboundary” issues is important. I don’t see how the fact that an ecosystem extends across political jurisdictions (e.g., the U.S. and Canada) would come into play in assessing the production function of ecosystem services it provides.

e) The recommendation on p. xiii and p. 12 that ORD develop a grants program for teacher education is not adequately justified. No one would disagree that teacher training is valuable, but is this an appropriate use of ORD time and resources? Likewise, the Committee needs to better explain/justify its recommendations that ORD should focus its limited resources on public education/outreach efforts.

f) The recommendation on p. 5 that EPA work with other agencies to produce an IPCC-style assessment of status and trends of ecosystem services requires clarification. The IPCC assessment cycle represents an enormous international activity. Is that really what the Committee had in mind?

g) The recommendation on p. 14 that EPA “develop forecasting models from the information in available databases” isn’t clear. What does the Committee have in mind here?

h) The list of “principles” for judging the locations of “place-based demonstration projects” on p. 19 seems likely to over-constrain the problem for ORD. Perhaps these could be more clearly presented as principles for the Agency to consider, without suggesting that they must all be met.

9. Dr. Rogene Henderson:

I am not an ecologist, so I limited my review to a detailed reading of the transmittal letter and of the executive summary and a more skimming review of the rest of the document.

I found this advisory to be clearly written and well organized. Each of the charge questions was carefully addressed. The report was clear and logical and the recommendations appeared to be well-supported by the text of the report. I especially agreed with the recommendation (page 7) to combine and integrate the HHWB and ESV elements of the Plan. The effect of the ecosystems services on human well-being is a link that must be made.

10. Dr. David Dzombak:

(a) Are the original charge questions to the SAB committee adequately addressed in the draft report?

The SAB Ecological Processes and Effects Committee (EPEC) review has addressed all of the charge questions. Each of the charge questions appears to be addressed in sufficient depth, and specific recommendations have been developed for each of the charge questions and sub-questions.

(b) Is the draft report clear and logical?

The organization of the draft report and its executive summary by the SAB EPEC follows the charge questions directly and is easy to follow.

There are some aspects of the review that I would encourage the committee to reconsider. There are some specific instances where the recommendations of the committee are not consistent. More importantly, the committee did not recommend dropping any of the proposed activities to achieve focus and perhaps more impact.

(i) The committee report makes clear that the comprehensive, broad-scope plan set forth by ORD is commendable in many respects, but also highly ambitious and unlikely to be achievable within existing budgetary and personnel constraints. After reading the detailed committee support for this position, it seems to me that many aspects of the comprehensive plan have no chance of being achieved. Financial and human resources available to the Agency appear to be far below what would be needed to implement the plan. I get the sense that if ORD embarks upon implementation of the current plan and attempts to advance on all fronts, progress on each front will be very slow. I would ask that the committee consider making recommendations of activities that should be omitted in order to focus available resources on high priority issues and make an impact. More recommendations such as the one made by the committee to concentrate on terrestrial systems rather than coral reefs (pages 16,17) would be helpful.

(ii) On page 4, in the next to last bullet, the committee discusses the speed with which new ecological challenges are developing, and recommends that ORD put into place an adaptive structure that can address high priority, rapidly changing problems. If this is indeed the view of the committee, then other recommendations urging ORD to focus its resources better would seem to be in order.

(iii) On page 11 (bottom) and page 12 (top), the committee comments on the proposed outreach and education activities, noting that “OE has not historically been a significant part of ORD’s work and, therefore, additional expertise may be needed in this area.” The committee goes on to call for a more comprehensive OE plan. This recommendation, for ORD to build significant new capacity and use scarce funds on non-research activity, seems hard to justify given the scope of the research needed and the concern about having funds to do it.

(iv) On page 28, the committee recommends that ORD “make the STAR program a priority in efforts to leverage resources and achieve goals by: enhancing the STAR Graduate Fellowships program; providing funds for non-targeted, exploratory extramural research ...; and developing a competitive grants program to run summer credit workshops for teachers...” This recommendation for non-targeted investment seems inconsistent with the concerns expressed about inadequate resources to implement the core aspects of the program. It seems inconsistent to comment about an overly ambitious plan and then recommend such non-targeted investments. I suggest that more recommendations for narrowing focus and targeting resources are needed, rather than recommendations of the sort offered here.

(c) Are the conclusions drawn, and/or recommendations made, supported by the information in the body of the draft SAB report?

The conclusions drawn and recommendations made are supported by the information in the body of the draft report. My only recommendation in regard to this question is that the inconsistencies noted under (b) should be addressed.

11. Dr. Valerie Thomas:

Letter to administrator, p. i, lines 25-26: “the SAB strongly supports this strategic direction and commends the Agency for developing a research program that has the potential to be transformative for environmental decision-making as well as for environmental science.” Where are these claims, “potential to be transformative for environmental decision-making as well as for environmental science” supported? The statement is repeated in the Executive Summary, p. vii, lines 35-36. There should be at least one paragraph somewhere that describes how this research will be transformative for environmental science. Throughout the document, the doubt cast on the feasibility of the plan, and the lack of funding for fundamental research, casts doubt on the transformative potential of the research plan. If there is transformative potential, that needs to be explained and highlighted.

What does EPA need to do to achieve the transformation?

Letter p. i, lines 33-35. “we have a number of concerns about the draft Plan... related to the tension between stating an important and ambitious vision and producing a practical implementation.” Overall the meaning of the letter is not clear. It reads as if the SAB supports the plan, but thinks, as usual, that there should be more money for research. But from the details of the body of the report, the Panel really seems to be saying, perhaps, that it strongly supports the “direction” but not the Plan, because the Plan seems unlikely to accomplish its stated goals. If that is what the Panel is trying to say, the Letter should be revised to make this clear.

Executive Summary, p. viii.

lines 2-3: “goals are unlikely to be accomplished”
lines 15-16: “goals cannot be accomplished without basic ecological research”
These statements don’t line up with the Committee’s support for the research plan.

Executive Summary p. ix:

Line 5: “the Committee supports long-term Goal 1”

Lines 38-39: “the Committee is concerned about the overall feasibility of accomplishing Long-term Goal 1.”

These two statements don’t add up with the support of the Committee for the Plan. Why does the committee support the Goal if it can’t be achieved?

pp. 3-4. The report says that \$68M will be dedicated to the program, and the Committee recommends use of STAR program funds as well as more internal

funds. It would be helpful if the Committee could say how much funding would be enough, and the relative balance of external and internal funding.

p. 7, lines 16-46 – the suggestion to combine HHWB and ESV seems useful, as does the suggestion to combine DSP and OE.

pp. 10 line 30 – p. 11 line 42. This entire section calls into question the validity of the plan for developing the DSPs (Decision Support Platforms). The Committee recommends, on p. 11 line 14, that “EPA should more clearly describe how the DSP would actually work.” The benefit of this recommendation is unclear: the Committee seems to be saying that the idea of the DSP has not been thought through, and that making one at all will face significant obstacles. So asking EPA to describe how it would work seems to be a rhetorical question – by describing how it would work it would become clearer that it would not work. Rather than this pedagogical recommendation, it seems that the Committee should clearly say that the DSP does not seem to be feasible and should be cut from the plan or significantly revised.

p. 16, lines 9-16: The Committee recommends dropping the study of reactive nitrogen. I think that in the SAB review of the sustainability research plan, we recommended that EPA take on one or two high profile important case studies, to demonstrate the actual value of the research on a major problem. This proposed focus on reactive nitrogen seems to be in that spirit. So I wonder if SAB is giving EPA conflicting advice in reviews of different but related research programs. On the other hand, Long-term goals 4 and 5 also address specific case studies; how all of these fit together, and which ones are scientifically stronger, or more important for EPA’s mission, is not very clear.

12. Dr. James Galloway and Dr. Thomas Theis

In general we feel that the committee has done a good job with its review, however we believe that the negative tone of the review of Goal #3 is not appropriate. Specifically, we are getting a mixed message from this review; it appears that the advisory committee is split on the importance of Goal 3. Unfortunately, the disagreement comes across as apparently recommending that EPA not pursue an integrated nitrogen assessment. In our view this is unwise. The issues of nitrogen are of such current importance now, and will only grow in the future, that what the committee should do is to advise EPA on how to make the proposed program better in both the short term and the long term.

In addition to this general comment, we have the following specific responses to the bulleted items in the committee’s review.

- a) The report is in at least one important way forward-thinking in its endorsement of the ecosystem services approach to evaluating environmental quality, but seems misinformed on the importance of Nr to

the production (positive and negative) of goods and services produced by ecosystems.

- b) The suggestion to substitute Hg for Nr effects research would move the MYP in a very different direction. Hg impairs ecosystem functions by virtue of its toxicity. Nr has both positive and negative impacts, and presents policy makers with a useful example of the need to incorporate tradeoffs into policy.
- c) Hg already has a MYP. If EPEC wished to endorse studies involving Hg then they should be sure to note this, and encourage EPA to work cooperatively.
- d) The sentiment of some committee members to use the funds for other areas in the Ecological Research Program (e.g., outreach and education) is puzzling. This would not only delay the establishment of a needed national program, but would send a strong signal that such a program is not needed.
- e) We agree with the advisory committee that ORD should partner not only with other EPA entities (i.e., OAR) but also other agencies. From our understanding, these partnerships have always been planned.
- f) Apparently some members of the advisory committee felt that the research description was too general to be evaluated, while others felt the proposed research was tractable. In the spirit of a constructive Advisory, it would be useful for the former group to be more specific of what they are looking for.