Preliminary Comments from Members of the Chartered SAB on the SAB Draft report *Review of EPA's draft Oil Spill Research Strategy (July 11, 2011 Quality Draft))*

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Comments from lead reviewers

Comments from Dr. Claudia Benitez-Nelson

1. Were the original charge questions adequately addressed?

Yes. The Panel Report was clearly written and easy to follow. It provides a number of explicit and important recommendations for improvement that will greatly enhance the *Draft Oil Spill Research Strategy* to be implemented by the EPA. I am particularly pleased by: 1) the requests for more detailed information on future research avenues and how they specifically address the data needed by EPA to implement its mission, 2) the discussions revolving around Environmental Justice and the wide variety of impacts oil spills have on specific communities, 3) the wide range of issues associated with dispersants that need to be better clarified, and 4) a renewed focus on modeling efforts and the decision making process.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

Yes, but mainly minor in scope.
Dr. Swackhamer's Letter: Page 2, lines 18-28. It would be helpful if a sentence on rational decision making was added here as it is an important component of the Quality review's comments

Under "Response to Charge Question 1" Page 3, lines 23-26. It would be useful to provide an explicit example here regarding the lack of clarity between a general research theme and the EPA mission. Specific examples are provided throughout the report and I believe they are exceedingly helpful in focusing the revision of the *Strategy* per the quality review request.
Page 5, lines 19-24. Please include a few sentences here regarding the outcomes from the Coastal Response Research Center workshop and provide guidance as to how their suggestions should be used for the EPA *Strategy*.
Page 21, lines 38-42. The issue of whether or not to clean up an oil spill is a very important one, particularly for coastal wetlands. This is only given a very short discussion in the Quality Review and yet many would argue that it is one of the most important pieces in any cleanup strategy – does the cleanup prolong the contamination event or make it worse? This is discussed in detail for dispersants. I would very much like to see a more expanded discussion of why this should be included in the EPA *Strategy* and a statement to this effect should be mentioned explicitly in the Executive Summary.

3. Is the Panel's draft report clear and logical?

Yes. A few typographical/editorial errors and minor omissions are noted below:

Dr. Swackhamer's Letter

a) Page 2, line14. Remove extra ")" after Sustainability
b) Page 2, line 21, remove extra "."
c) Page 2, line 24, remove extra "."
d) Page 2, line 31, remove extra "."
e) Page 3, line 10, remove extra "and"

Quality Report

a) Executive Summary Page 2, line 42, add "," after Sustainability
b) Introduction, Page 1, line 6, remove extra "."
c) Introduction, line 8, add "oil" before releases.
d) Page 6, line 43 add space between "prevention of"
e) Page 18, line 24 add space between "and oil"
f) Page 19, line 9. Remove () for "Page 23"
g) Page 20, line 11. Delete extra ","
h) Page 20, line 29. Delete "and"
i) Page 21, line 1, remove "," after that
j) Page 21, line 11 insert "a" after "by"
k) Page 21, line 20, remove extra "."
l) Page 22, line 24, replace "collaborating" with "collaboration
m) Page 22, line 25, remove extra "the"
n) Page 25, line 18. Add "the" after "of"
o) Page 25, line 31. Add "?" after "study)"
p) Page 25, line 33 add space between "or developed"
q) Page 25, line 39. Move the "on" to read "described in this section on"

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes. The SAB Committee provides a number of examples of the level of detail requested and references are included for supporting their suggestions for modification of the report. The criticisms are well reasoned and appropriate.

Comments from Dr. Judith Meyer

The report is well done. I have one general concern, which is reflected in several of my responses to the quality review questions. To what extent are freshwater and terrestrial environments discussed and dealt with in the strategy? Throughout the SAB report, marine environments are discussed with a few mentions of freshwater and almost nothing about terrestrial. So it is hard to judge if the committee considered coverage of freshwater and terrestrial environments to be adequate. Almost all of the additional research needs were in reference to marine and coastal environments; this makes it seem as though there are no research needs for spills in freshwater or terrestrial environments.

1. Were the original charge questions to the SAB Committee adequately addressed?
YES

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?
In general, **NO**; but see the following comments:

The first paragraph of the Letter makes it sound as though there was no consideration of research into ecological impacts, only human health impacts: " estimate the acute and chronic health risks for spill response workers and the public from oil spills and spill mitigation"

Letter, line 26: all environments? Or all aquatic environments? 1,40 It is not clear in either the letter or Exec Sum what is meant by inland environments – is it both aquatic and terrestrial? This has to be clarified!

ES6, 25-31: Since it is not clear what environments are considered "inland", I'm not sure if the following comment is relevant. Does the strategy consider spills near lakes and rivers (e.g., the recent pipeline rupture on the Yellowstone River) that provide a source of drinking water? Is that a part of the human health impacts of the research strategy? What about contamination of shallow surface water aquifers that might also be a drinking water source?

5, 2: If the Strategy does not describe current efforts with respect to outreach and research on Gulf Coastal communities, how does the committee know it needs to be enhanced? Shouldn't the recommendation be to evaluate these efforts and determine if they need to be enhanced?

7, 16: I think SAB recommended in our recent ORD review, that they consider that they have six programs, not four plus two as discussed here.

8: Does the strategy adequately address efficacy and ecological effect of dispersants in freshwater environments?

21, 6-12: I was surprised that specific companies were singled out in this example. Also "were" instead of "where" on line 9.

B-4, 1-4: It is not clear how this suggestion is relevant to oil spill recovery.

3. Is the Committee's report clear and logical?
In general, **YES**; but see the following comments:

Letter: Did ORD ask for this report? If so that needs to be clarified. Do ORD researchers do this research?

Letter, several places Executive Summary: Lots of "SAB believes" – I think we have received comments on other reports encouraging us to use words other than "believe."

Letter, 2, 12, also Exec Sum: ORD's six (not four) programs. Is the panel recommending incorporation of oil spill response into all six programs? That sounds too dispersed! Or figuring out where among the six programs the Oil Spill Response Research belongs?

Letter, 2, 42-44: Suggest change this to: "Ecological populations and communities will also have different exposure scenarios and pathways that should be considered depending on site of the release and receiving ecosystem."

There are some typos in the letter.

iii, 27: independent consultant twice

ES 3, 27: making decisions. Also, it is not clear which complex questions responders are dealing with.

ES 4, 12: change to "mixtures of chemical treatment agents and oil."

4, 43: "utilize" rather than "turn to"; then "to decrease"

5, 10: It would read better if "research related to" were taken out of the sentence.

5, 19-24: Is there a recommendation related to this information? If not, why is it in the report? Does the committee think more such workshops are needed?

9, 12: "This approach"? Antecedent unclear.

11, 18: Take out "In"

13, 10-11: This is unclear. Is the Strategy a result of this EBRS process? The sentence says "was developed" but it is not clear who developed it and where it is.

19, 22-23: Whatever what? Regulations? Protocols? Testing requirements? Clarification is needed.

20, 29: and what?

21, 34: words missing – "devastating effects such as"?

22, 14-15: should be "integration among" and "questions"

22, 25: thethe

26, 8: "data are"

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

YES

Letter, p.1, 41: Here it says that in many places in the report, agency responsibilities are not clearly delineated. I saw this primarily in the Human Health section. Was it in other sections, and I just missed it? Or should this perhaps not say "in many places"? Similar point made on p. 2, line 5 that makes it sound as though it is a problem throughout the report. I did not pick up on this in the other sections.

Letter, p. 3, 15: I do not recall a specific discussion and recommendation for integration as a distinct element of the strategy in the body of the report.

Comments from Dr. Duncan Patten

Comments on the draft report *Review of EPA's draft Oil Spill Research Strategy* by Patten
Questions:

1. Were the original charge questions adequately addressed?

In general, the charge questions were appropriately addressed by applying the same question to different components of the study.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

Although this point may not be a technical error, the Panel recommends doing baseline studies at oil well locations but this often is not the point of spill as pipelines and refineries also "spill". The Panel should suggest "case studies" for baseline data at representative potential spill locations. See suggestions in comments below.

3. Is the Panel's draft report clear and logical?

The report is clear and logical although a few sentences need clarification (see comments).

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Some recommendations need expansion, such as baseline studies, but overall, the conclusions and recommendations are supported by the text.

General Comments:
Letter to Administrator:
Page 2, line 33. The Panel suggests baseline data. What extent do they suggest. Later they suggest baseline near oil collection sites but they should expand this to processing and transport locations (Yellowstone River spill is good example).
Page 2, line 42. Does term populations refer to populations as part of communities or is it human populations?
Page 3, line 9-11. Sentence needs editing.

Executive Summary:
Page 3, line 5-6. The panel suggests integration but might it suggest what it means and give example (if in body, bring one forward).
Page 4, line 43. Should include areas of processing and transport (see comment in Admin. letter above).
Page 5, line 5. Might you discuss or point out development of the indicators (bring forward if in body of text).

Body of Report
Page 5, line 10. Good point on need for social and behavioral sciences. Can this be strengthened?
Page 7. Several discussion of prevention which at first seems somewhat peripheral to studies of spills but the Charge Question includes the panel address prevention...so OK.

Dispersants
Page 9. Paragraph starting line 23. This paragraph shifts from the topic of dispersants (the heading of this section), to a discussion of public and environmental health...it seems to belong somewhere else especially based on bullet points which are not clearly aligned to dispersants (or don't seem to be)... and yet the following paragraph returns to dispersant discussion. Make the paragraph more clearly align to dispersant discussion.

Shoreline, Coastal and inland effects research.
Page 14, paragraph starting line 9. This discussion of EPA's response and research activities should bring into the discussion "learning from existing spills of all types" but perhaps more dramatic inland are spills in rivers where oil rapidly disperses. There have been several of these in the last year of so (e.g., Michigan and Montana). Also pipeline spills on terrestrial ecosystems is not uncommon and when it occurs in the arctic, response and cleanup is difficult and arctic ecosystems respond quite differently than temperate.
Page 14-15. Why in the discussion of effects is the emphasis placed on populations and communities when there are many other components of ecosystems that will be impacted and could remain impacted for decades.
Page 15. Are the endpoints mentioned in first paragraph on page 15 essentially the "indicators" recommended in Executive Summary? Which term is most appropriate here?
Page 16, line 44. A very good point on need for "diverse and integrated models and scenarios for differing ecosystem types and their unique food webs to support rapid to mid-term response decisions." This concept should be strengthened throughout the review. One problem with this is the recommendation made in several places in the review of getting baseline data for possible spill locations which are nearly infinite. Can this recommendation be narrowed some? E.g., potentially high risk spill locations but with some relating to every stage in the life cycle of oil production (e.g., well sites, pipelines, refineries).

3.3.3. Innovative Processes and Technologies Development
Good discussion...no comments

3.3.4 Human Health Impacts
The Panel questions EPA's role relative to other agencies when it comes to human health and exposure. The discussion seems logical and raises appropriate issues as EPA often deals with similar situations relative to other exposure elements.

Comments from Dr. Thomas Zoeller

The following comments are provided in response to the July 11, 2011 memo by DFO Dr. Angela Nugent concerning SAB review of Review of EPA's draft Oil Spill Research Strategy. This memo asked contributing SAB members to specifically address the four quality review questions from the vantage point of our own expertise. These questions are:

1. Were the original charge questions to the Panel adequately addressed?
2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the draft report;
3. Is the draft report clear and logical; and
4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report.

1. In general, the document is well structured and well written. The charge questions are clearly stated and clearly answered. These are rather open-ended questions, and it provided the panel with a great deal of flexibility in the way they approached the charge.

2. This reviewer sees no technical errors (see below).

3. In general the draft report is clear and logical. However, there are some topics that may be enhanced. Specifically, the report discusses the need to evaluate the toxicity of the dispersants in combination with the oil, but this discussion may not have gone far enough. Although it was implied, the document did not address specific issues such as the concentration of oil/dispersant mixtures in salt or fresh water and what organisms might be the focus of this work. This may be too detailed for the current review. However, it also would seem necessary to know the constituents of the dispersants themselves since having this kind of information could provide insight into the kind of toxicity that could be generated and thus, more directed study would be supported.

4. In general, the recommendations provided are supported by the body of the report, and these recommendations are clear.

Comments from other SAB Members

Comments from Dr. George Daston

1. Were the original charge questions adequately addressed?

I believe that the charge questions have been adequately addressed

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

On page 22, the report states that research on human health effects will be conducted by federal agencies other than EPA. One of the agencies noted is the National Toxicology Program. My understanding of NTP is that EPA is one of the agencies that has a permanent seat on NTP's Executive Committee and has the ability to influence NTP's research agenda. Therefore, it seems to me that NTP should not be considered as being entirely separate from EPA.

3. Is the Committee's report logical and clear?

I found the report to be logically presented and easy to follow. There was good consistency between the body of the text, the Executive Summary and the cover letter.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

I believe that the Committee's conclusions and recommendations are supported by the text.

Comments from Dr. Terry Daniel

This review is generally well written and clearly addresses the key charge questions in a helpful manner. There are numerous indications in the detailed text of a rather hurriedly patched together report, including numerous double periods (especially in the Executive Summary), omitted words and incomplete sentences. There are also sections of the text that are not consistent in tone and approach with the majority of the report; the section around report pages 18-22 seems to get too specific in suggesting research questions and even particular research projects, given the report being reviewed is a description of a research strategy, not a specific research program.

The Panel rightly calls for better integration of the proposed research strategy into the ORD's transdisciplinary approach and realigned research programs. Consistent with that recommendation, it is encouraging to hear reinforcement of calls for increased behavioral (and social) research. The distinction made by the SAB panel between the use of behavioral data and principles to improve and leverage bio-physical research (as in using existing principles to improve communication about risks) versus the development of behavioral research to evaluate and improve data and principles (as in developing better risk communication methods) is very important. There is a real danger that (social and) behavioral science will be viewed as a post hoc way to "sell" risk concerns and risk management policies that have been decided on the basis of bio-physical/technical grounds, rather than as an integral part of a multi-disciplinary research effort. In this context, the review does miss a number of opportunities to point to specific places in the general research strategy where (social) behavioral research could play important roles. The sections on risk characterization and communication are a good example of such opportunities. It would be useful here also to point out that risk characterization should anticipate risk communication—including recognition of what potentially-affected people know/believe about the multiple aspects of the risk, what impacts they are likely to experience, and their attitudes and abilities relevant to possible mitigation approaches.

The Panel's suggestions about an "event-based" research strategy seem especially important, along with references to addressing spill events in a broader ecological context and following a more complete life-cycle model. However, in many places in the review (and presumably in the EPA report) the discussion seems to start with and to focus on the "spill." Clearly, a life-cycle approach would start well ahead of the "incident," including planning and decisions about where facilities might be sited, the design, construction and operation of the production and other facilities, as well as the development of facilities and procedures for mitigating and responding to spills. That is, the "scenario" for an event must start before the spill incident, and extend well afterwards. The review makes this point in general, but then in a number of specific instances it falls back to starting and focusing too much on the spill incident.

The Panel generally notes the importance of considering ecosystem services, rather than just ecological effects per se. This is important and deserves a little more effort to make clear how this might affect the oil spill research strategy. In particular, an ecosystem services perspective may change the focus of ecological research to a different set of "end points" and processes than a traditional ecological approach might address. This also presents another place where social/behavioral research should play an important role, for example, by identifying and

articulating what changes in ecosystem processes and products people care about and are likely to affect their well being.

1. Were the original charge questions to SAB Panel adequately addressed?
   Yes. With regard to the important suggestion that more attention needs to be given to the specific roles of the various agencies involved along with EPA in implementing the research, and the integration of efforts among them, there is some question about how specific the EPA can/should be in laying out a research strategy where many specifics are simply as yet unknown.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?
   No. There were, however a number of unexploited opportunities to point out specific places where social/behavioral research might make useful contributions to the research program. The Panel made an important contribution by pointing to the difference between using existing behavioral science to leverage technically derived policies and integrating new behavioral research into a multi-disciplinary program to achieve more effective risk management policies.

3. Is the Committee's report clear and logical?
   Yes. However, in the several places where the Panel concluded that "the SAB did not identify any science questions that should be deleted at this time" it might be worth noting that there are strong implications that some research (e.g., bench studies of particular isolated oils/dispersants in very limited environmental contexts) are not likely to highly useful for the broad event-based, life-cycle strategy the Panel is recommending.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
   Yes.

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Comments from Dr. David Dzombak

1. Were the original charge questions adequately addressed?

   Yes, the original charge questions are adequately addressed.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Panel's report?

   I found no technical errors.

   In relation to omissions, I was surprised that there was no discussion of the burning of oil as a control strategy. The amount of oil burned during the Deepwater Horizon spill was enormous, and the need for it was hard to understand, especially long after the spill was initiated and oil was being captured. The role of the EPA in the decision-making which led to permission to burn vast quantities of crude oil after capture rather than requiring discharge into a tanker was unclear. This is a control strategy that involves significant release of air pollutants, and I would expect that the EPA had a role in approving it. In testimony before the U.S. Senate Subcomittee on Commerce, Justice, Science and Related Agencies on July 15, 2010, EPA Administrator Lisa Jackson discussed the role of the EPA in the response to Deepwater Horizon. While much of her testimony focused on evaluation of dispersants, she also discussed management of captured oil and air monitoring. Burning of crude oil as a control strategy is a primitive approach that would seem to warrant research into 21st century alternatives.

   Also, while much of the research strategy is applicable to both discharges to water and inland discharges, the charge to the Panel and the response of the Panel are presented with much discussion of the Deepwater Horizon spill, which is understandable. Nevertheless, it is useful to remember that pipeline spills account for the largest amount of oil spilled in the U.S. every year. The Panel may wish to encourage the EPA to include some special focus on pipeline spills and their detection in the research strategy.

3. Is the Panel's draft report clear and logical?

   The draft report is well written and well organized.

   The Panel's call for clarity as to which federal Agency has primary responsibility for which research activities in the planned collaborations merits the primacy given to this recommendation by the Panel.

4. Are the conclusions drawn or recommendations provided are supported by the body of the Panel's report?

   The conclusions and recommendations are adequately supported in the body of the report.

Comments from Dr. James Hammitt

1. Were the original charge questions to adequately addressed?
Yes.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

It might be useful to say something in support of the underlying logic of the draft research strategy, which is evidently framed to identify decisions that may be required in the event of a spill and research that can help answer science questions that are critical to these decisions. This sounds like an attempt to apply decision-science ideas about the value of information to developing a research strategy. Recognition of this point (and evaluation of how well it is done) relates to the mention of decision sciences at p. 5/line 10.

The report often suggests EPA set priorities among research efforts. It might be useful to provide some guidance about how to do this. One idea is that priorities should be set in accordance with the expected value of the information to be developed (for decision making in the event of a spill). For this, the probability and severity of different types of spills (i.e., material spilled, environment where spilled) is relevant. These factors are presumably related to the scale of oil production of different types and in different environments (e.g., increasing in deep waters and Arctic environments?). Another point is (as acknowledged at the bottom of p. 13) to avoid the error of fighting the last war (i.e., being overly influenced by the Deepwater Horizon case, which is accessible and hence likely to be over-represented in thinking about possible future spills).

In the section on risk communication (p. 24; pp. 25-26) it might be worth saying something about the goals of risk communication (which relates to defining 'better' risk communication). One goal that is relevant in the paragraph on p. 24 concerns the fact that 'how communities perceive their risk' can influence people's behavior and hence health risk and other consequences of the spill. If people misperceive their risk, they may over- or under-react, incurring unnecessary costs, disruption, and increasing other risks (e.g., transportation risks when evacuating an area) or failing to take appropriate measures to reduce their risk, respectively.

The letter to the administrator discusses risks from PAHs, but the corresponding part of the report starts with concern about carcinogens present in oil (and dispersants?) then focuses on PAHs. It would be useful to clarify whether there is need for research about other carcinogens or whether PAHs are likely to dominate.

3. Is the Panel's draft report clear and logical?
Yes.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
Yes.

Comments from Dr. Cecil Lue-Hing

General Comments
The Panel has done an excellent job of reviewing the Research Strategy as requested by the EPA, and has offered some very useful comments and recommendations in response to the three charge questions posed by the EPA.

Quality Review Questions

1 – Were the original charge questions adequately addressed?
Yes.

2 – Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?
I did not find any.

3 – Is the Panel's draft report clear and logical, and
Yes – I found the report to be clear and logical.

4 – Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
Yes – The conclusions are supported by the body of the report, and they stress among other things, the desirability of the strategy to integrate the research themes, consider green alternatives within the context of sustainability, enhance the visibility and priority of environmental justice issues, pay more attention to the potential impact of spills of alcohol-based fuels, develop a more robust baseline data initiative, and recognize the importance of prevention in the strategy even though the management of the research on prevention may be the direct prerogative of other agencies.

Specific Comments
We have learned from the recent DWH Gulf Oil Spill experience that subsistence communities, poor communities and economically struggling communities, can be disproportionately, more severely impacted by oil spills occurring in or near their communities, and I support the Panel's call to enhance the visibility and priority of environmental justice in the research strategy.

Transmittal Letter
The transmittal letter is concise and informative. It effectively introduces the topic, briefly explains the need for the SAB review, acknowledges the good efforts of the EPA, identifies deficiencies in the strategy, and proceeds to summarize the Panel's recommendations and suggestions designed to improve the strategy.

The Executive Summary
The Executive Summary is straightforward and well done. It provides the obligatory brief introductory narrative which adequately prepares the non-expert reader for the subsequent discussions, and introduces the three charge questions. It then proceeds to offer highlights of the suggestions and recommendations from the body of the report in response to the three charge questions.

Comments from Dr. Bernd Kahn

Here are my comments on the July 28 Oil Spill review. None of my itemized comments apply to the technical contents, which are very well done. My response to the four quality review questions are, in order, yes, no, yes, and yes. Specific suggestions for correction are:

Letter, p.1, l.40: Insert comma after 'collaborations'.
p.2, l. 21: Delete second period; also on l. 24 and l. 31
p.2, l.22: Insert comma after 'system'; also on l.32, after 'information'.
p. ii, l. 9: Delete "s' at end of line; also l. 12 and 25.
p.3, l.10: Delete 'focused on'.
p.3, l.12: Replace 'that considers' with 'of'.
p.5, l. 4: Insert 'a' after 'at'.
p. B-1, l.15: Regulation' (sp.).
p. B-1, l.18: Delete 'their'.
p. B-1, l.30: Delete 'or quickly becomes heavier than seawater'.
p. B-2, l. 6: Change 'methods' to 'method'.
p. B-2, l.20: Delete '-A', capitalize 'Subsurface'', and change 'plume' to 'plumes'.
p. B-2, l.31: Move 'poorly confined' to in front of 'hydrocarbons' and delete 'hydrocarbon'.
p. B-2, l.32-35: This sentence does not make sense. Should 'unlikely' be deleted and 'not' be inserted before '100%'?
p. B-3, l.11: Insert comma after 'Generally''
p. B-3, l.26: Not clear; after 'technology', is 'sand cleaning' an example or an alternative?

Comments from Dr. Nancy Kim

The panel's report provides EPA with good advice on how to improve the research strategy.

1. Were the original charge questions to the Panel adequately addressed?

   The research questions appeared to be answered, although indirectly. The report's conclusions would be clearer if the charge questions were answered directly early on in the discussion of individual charge questions.

   The report provides many good suggestions, but tends not to make explicit recommendations. The report would be stronger if the panel added direct statements such as the panel recommends that EPA… This is true for the report as a whole, but a statement on page 19 (body of the report), line 32 is a good example. The report states, "The project areas descriptions section of the Strategy are disjoint and could possibly be improved by restructuring the text into a more sequenced net environmental benefit analysis (NEBA) type approach to identify the type of incident and the technological improvements that are required to meet this philosophy." The next page or so discusses NEBA. The verb "could possibly be improved" conveys a weak suggestion, not a recommendation that EPA do something.

   The letter to the administrator doesn't have to answer all the charge questions directly, but could probably benefit from having at least one paragraph about its overall response to the charge questions. The letter would be stronger if the report's major comments were given in the form of recommendations.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

   On page 5 (Executive Summary), lines 9 to 11, the report discusses the needs for baseline/background information on environmental conditions and stresses. Does the committee have any suggestions as to how this should be accomplished?

   On page 11 (body of the report), line 34, the panel states that the research needs to be evaluated and prioritized. Did the panel consider suggesting criteria for the evaluation and prioritization or that EPA needs to develop criteria?

   Section 3.3.3 discusses innovative processes and technologies development. This area would seem to benefit from prevention research. The panel may want to consider adding a few words about prevention in this section.

   The first paragraphs of Section 3.3.4 gave good examples of the problems EPA (and other agencies) may face if they don't specify how they will coordinate and integrate their results in this research area.

The panel may want to consider adding some newer references to the last sentence on page 23, line 25.

Section 3b on page 25 comments on removing the STAR objectives in the human health impacts section because they are not related to this area. Did the panel consider recommending STAR grants for the human health impacts section, particularly the risk communication area?

3. Is the Panel's report clear and logical?

   Yes.

4. Are the conclusions drawn or recommendations provided supported by the body of the Panel's report?

   Yes.

Comments unrelated to the 4 charge questions.

1. The report mentions the four programs (ACE, SSWR, SHC, and CSS) and the two cross-cutting areas (HHRA and HSR) in a couple of areas. For example, see page 2 (Executive Summary), line 39. At our June meeting, we and ORD had some discussion about the 4+ 2 picture of Dr. Tiechman's. The panel may want to consider rephrasing this based on that discussion.
2. The report discusses PAHs in Section 3.3.4 The panel may want to consider referring to the recent SAB PAH report.
3. The punctuation and grammar need to be reviewed.

Minor comments

1. Acronyms – CDC is Centers **for** Disease… and not Centers of. The possessive forms of the agencies should probably not be used (e.g. Department of the Interior's).
2. Executive Summary, page 1, line 29. This paragraph is a one sentence paragraph and the sentence does not use parallel construction. It should be edited.

Body of the Report

1. Page 1, line 25-26. Sentence states EPA sets policy…and authority. This phrasing seems odd. Usually laws give authority and agencies implement them through regulations.
2. Page 10, line 40 (and perhaps in other places). The sentence states toxicity studies of sublethal and chronic exposures… Studies of chronic exposures are sublethal exposures. Does the panel mean acute exposures?
3. Page 3, line 41. Sentence states that alcohols do not tend to evaporate into the atmosphere. Additional information may be needed to explain this sentence since the low molecular weight alcohols (methanol, ethanol, etc.) do readily evaporate. Maybe adding something such as do not tend to evaporate when mixed with water.

4. Page 5, paragraph beginning line 19. This paragraph discusses a workshop that was held and notes that it was the first of its kind. Adding information about 1 or 2 major recommendations that came out of the workshop might be useful.
5. Page 13, line 10. Adding a parenthetic in this sentence to refer to Appendix B would help the reader.
6. Page 15, line 8. The word refugia is used and I think it was used earlier in the report. The panel should consider defining this word.

Comments from Dr. Jana Milford

1. Were the original charge questions adequately addressed?
Yes.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?
None that I identified.

3. Is the Panel's draft report clear and logical? and
Yes. A few minor suggestions to improve accessibility of the Executive Summary are to briefly explain what is meant by "Decision Management Framework" and "Net Environmental Benefit Analysis", since the specific meanings of these terms of art may not be known to readers outside their original fields of application. (They are explained relatively well in the body of the report, but providing brief explanations in the ES would still be helpful.) Also, the ES uses the phrase "innovative processes and technologies" a few times before the context eventually makes apparent what these processes and technologies are for (oil dispersal or collection). Perhaps that could be explained upon first use of the phrase.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
Yes. The panel did a very good job of providing support for its recommendations.

Comments from Dr. Horace Moo-Young

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes, the charge questions were adequately addressed by the committee.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

No technical errors or omissions were found.

3. Is the Committee's report clear and logical?

Yes the report was clear and logical.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

The recommendations and conclusion support the body of the report. I strongly support the committee's recommendations to provide additional research to support the goal of environmental justice.

In the report, it was stated that the fate and transport studies in deep water release is difficult and costly to reproduce experimentally. It is my suggestion that EPA work with and partner with the Army Corp of Engineers and RDECOM who have the Cold Regions Research Laboratory in Hanover, NH and the Waterways Experiments Station in Vicksburg, MS. These laboratories have large scale experimental facilities which could potentially develop and reproduce the experimental conditions to validate models. I am extremely skeptical about developing modeling approaches that do not have experimental verification or validation. Thus, there are fate and transport techniques utilizing high pressure facilities that could provide experimental validation for the modeling approaches being proposed.

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Comments from Dr. Amanda Rodewald

1. Were the original charge questions adequately addressed?
Yes.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?
No.

3. Is the Panel's draft report clear and logical?
Yes.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
Yes.

Additional comments:

The panel could better emphasize how essential it is for the draft Strategy to adopt a holistic/systems-level approach to understanding all population, community and ecosystem effects. This is especially important when considering bioaccumulation of dispersants because food web dynamics can be very sensitive to changes in community composition.

The research questions would be more useful if they were not framed to elicit dichotomous responses (yes/no) and instead were framed in a way that recognized that most outcomes will be context-dependent, to some extent. For example, the current question highlighted on page 28 in the draft Strategy simply asks "do dispersants bioaccumulate in aquatic organisms?" A more important question within a decision-making framework might be, "under what situations are dispersants most likely to bioaccumulate?"

The same can be said for the adverse ecological effects area of inquiry. Rather than "Are oil dispersant products or chemically dispersed oil chronically toxic to aquatic flora and fauna?", the better question would seek to identify under what situations (e.g., pH, salinity, temperature of water, season) / ecological conditions / amounts / etc… are they most likely to be toxic?" While the authors of the draft Strategy highlighted that sensitivity varies with life stage, there also is a relatively large body of literature indicating that exposure is environmentally and ecologically mediated.

The human health research focused almost exclusively on the physiological consequences of exposure, but the psycho-social effects did not appear to receive adequate attention. This was surprising to me given that (to my understanding) the primary human health consequences of DWH was psychological. There also are indirect health consequences that can result from direct economic impacts. While the report noted that the draft Strategy was weak on research related to behavioral and social science, the point could be better emphasized and perhaps the areas could be explicitly mentioned.

Comments from Dr. Kathleen Segerson

1. Is the report responsive to the charge questions? Yes

2. Are there any technical errors? Not that I am aware of.

3. Is the report clear and logical? Yes.

4. Are the conclusions/recommendations supported? Yes.

This is a well-written report.

My only comment relates to social and behavior science. Given the SAB's efforts to increase the amount of social and behavioral science research at EPA (and ORD in particular), it seems that this research area is one where there would be numerous opportunities and that we are missing an opportunity to point this out more explicitly. The letter and executive summary refer to environmental justice "considerations" but don't make explicit reference to the need for SBD science research on this. Similarly, there is no mention of risk communication, another big SBD issue, that I saw in either the letter or the ES. There is some brief reference to both of these in the body of the report (on p. 24), but it seems that the role that SBD research could and should play here should be highlighted a bit more up front.

Comments from Dr. John Vena

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

The SAB was asked to respond to 3 charge questions.

1. Does the draft Oil Spill Research Strategy encompass the most important research needed to enable EPA to better carry out its mission to prepare for and respond to oil spills, including future challenges such as biofuels discharges? Does the draft strategy appropriately address greener alternatives and innovation?

2. Is the research strategy organized appropriately to frame the questions in a comprehensible manner and to foster collaboration with outside entities as appropriate? If not, how can it be better organized?

3. Within each of the research themes: a. Do the science questions address key issues that can improve future oil spill prevention and response activities? Please identify additional high priority issues or science questions that should be addressed.
b. Should any of the science questions be deleted based on sufficient existing knowledge, low impact on decision-making, or for other reasons?
c. Are the proposed project areas described adequately to design research projects to achieve the anticipated outcomes? Please identify any project areas that should be refined or important project areas that should be added.

In my opinion Charge questions 1 and 3 were adequately addressed. Except for only in a few instances I did not see much narrative that responds to Charge Question 2, especially Question 2.2 on fostering collaboration with outside entities.

Several edits and points of clarification are noted below.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

None that I can tell based on my expertise.

3. Is the Committee's report clear and logical?

The cover letter is concise and summarizes most of the panel's main points. I found it difficult from reading the letter how each of the charge questions were answered and what specific changes in the Strategy were being recommended.
The executive summary is well done and provides an excellent overview of the responses to each of the issues. A brief summary at the end of the conclusions and recommendations would be helpful to the reader.

Pg 1 line 36 Should research "approach" be "strategy"?

Pg 2 line 31 The panel stated that EPA should communicate more effectively"—it would be good to specify how and in what way and what to communicate- the strategy?

Pg 3 line 6 and later in document the panel recommends that "Integration be a distinct element" How? What does this mean?
Page 5 lines 10 and 11 "to characterize risks ….. linkages should include baseline/background environmental conditions and stresses" This is also stated in body of report.. but it seems to be a sweeping statement that lacks detail to be helpful.

The statement on page 6 of exec summary lines 21-23 is an important point that should be stated in cover letter.

Report Page 12 Section 3.3.1 describes an Event based research strategy. This is not mentioned in cover letter or exec summary.

Page 17 line 35 Risk characterization is discussed but not defined or explained. Page 23 line 29 The panel states that the cancer risk model should be given high priority.. I disagree.. What is the basis for this recommendation?

Page 24 line 20 The panel briefly discusses gulf seafood consumption. This is one of the most important pathways for human exposure. What about studies of the contaminant levels of oil by-products, dispersants etc in seafood harvested from the Gulf?

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?
Yes. In my opinion the report is an excellent review of the major problems with the strategy and how several of the issues could be addressed. I found several of the recommendations to be vague and would benefit from specific examples.