

**Summary Minutes of the United States Environmental Protection Agency (U.S. EPA)
Science Advisory Board (SAB) Committee on Science Integration for Decision Making
March 30-31, 2010**

Chartered SAB Members: See Roster provided in Attachment A

Date and Time: March 30-31, 2010

Location: Science Advisory Board Conference Center, 1025 F Street, NW, Suite 3705, Washington, D.C. 20004

Purpose: To discuss the results of fact-finding activities conducted as part of a study of science integration supporting EPA decision making and to discuss the Committee's next steps.

SAB Participants:

Dr. Thomas Burke, Chair	Dr. John P. Giesy
Dr. John Balbus	Dr. Rogene Henderosn
Dr. Gregory Biddinger	Dr. James Johnson
Dr. James Bus	Dr. Wayne Landis
Dr. Deborah Cory-Slechta	Dr. Gary Saylor (by phone)
Dr. Terry Daniel	Dr. Thomas Theis
Dr. T. Taylor Eighmy (by telephone)	Dr. Barton J. (Buzz) Thompson
Dr. Penelope Fenner-Crisp	Dr. Lauren Zeise

SAB Staff Office Participants

Dr. Angela Nugent, Designated Federal Officer (DFO)
Dr. Vanessa Vu, Director

Meeting Summary:

The committee discussion at the meeting followed the issues and timing as presented in the agenda (Attachment B).

March 30, 2010

1. Convene Meeting

Dr. Angela Nugent, SAB DFO, convened the teleconference and welcomed the group. She noted that no written public comments and there were no requests for public comment. She asked Agency representatives to contact her if individuals would like to make a comment during the afternoon comment period on March 30th.

Dr. Vanessa Vu welcomed the members and expressed her appreciation for their involvement in fact-finding interviews conducted in EPA programs, regions, and offices supporting decision making. She noted a wide interest in the committee's activities across EPA.

2. Purpose and Review of the Agenda

Dr. Thomas Burke, the SAB Committee Chair, reviewed the agenda. He noted the unique opportunity presented by the information gathered during committee members' 73 interviews with Agency representatives. He noted the "incredible agency interest" and "incredible agency concern." He cautioned committee members that they have a serious responsibility to focus on the committee's change and to convert the large body of information gathered to recommendations that can help the Agency.

3. Discussion of key findings: Science integration for decision making in Regional Offices

Committee members began the conversation by reflecting on the interviews with regional offices. Several members noted that the interview summaries were just a "snapshot" in time. The issues discussed have changed over time and are dynamic.

Given that caveat, members listed their major observations from fact-finding interviews in EPA regional offices.

- Need for support for and building community among scientists in the regions
- Surprising extent to which regions get science from sources outside the Office of Research and Development (ORD) and program offices. They reach out to universities, states, and other federal agencies.
- Regions are resourceful in getting science needs met, but many needs are met through personal contacts, not systematic exchanges. Different regions (and different scientists within regions) have different levels of success in getting the science needed to support their programs.
- Regions have developed different expertise. It may be possible to develop regional "Centers of Excellence" in different areas that would allow regions to "tap into" different areas of expertise,
- Wide variation in practices across regions
 - Some use peer review; others don't
 - One region uses a multi-dimension criteria for problem formulation; others did not mention problem formulation at all
 - Regions that are co-located near multiple universities (Regions 1,2, and 5) have a richer intellectual environment to draw on. Regions that are located in cities with only a single major university seem to have a narrower outlook and run the risk of science that is "inbred"
- Wide variation across programs within regions
 - Scientists and managers in the Superfund programs are generally satisfied with guidelines, funding, stakeholder engagement, well-developed systems and processes.

- Other program areas lack guidelines, tools, data, funding.
- Some regions gave sense that resources were stretched thin; other regions (e.g., Region 5) seem better funded and have a variety of approaches, reasonable ways of approaching big problems.
- Wide variation in management of science across regions
 - In some regions, scientists felt unappreciated and expressed concern about limited pay, benefits, and ability to take training and interact with scientific peers. In one region, managers were present when SAB members interacted with scientists. In other regions, scientists were interviewed without managers present and reported opportunities for professional development and engagement in regional decision making.
 - Some regions and regional program offices have formal decision meetings where scientists are at the table with decisions makers (one Acting Regional Administrator encouraged a "Community of Practice" where scientists supporting decisions learned from each other as they contributed expert input to decisions being made); other regions and regional program offices do not.
 - In some regions, scientists have problems running scientific models supporting decision making on available computers
 - Senior leadership on science issues makes a huge difference for science integration
- Regional views of science integration very different from overview presented by the Office of the Science Advisor (OSA). Regions seem to operate independently with little involvement in OSA mechanisms.
- Stakeholder involvement is well developed in the Superfund Program, which is distinctive because it involves a formal approach and methods; other regional programs varied in the amount and kinds of stakeholder involvement.
- There is no systematic appraisal of the effectiveness of stakeholder processes (e.g., the test seems to be "if we we are sued and won...then the process worked.")
- Regions concerned with practical concerns about better integration of science; e.g., resource constraints; few social sciences; worry "about whether actions will be upheld;" potential that peer review might slow down decision-making.
- Need for more resources to help communicate science and risk to decision makers and the public
- Region's science needs do not seem to be an Agency priority. Should the SAB ask for a confirmation of the value of regional activities?
- Responses of regional scientists sometimes vary widely from responses of Deputy Regional Administrator
- Need to match the complexity of science and review of science to decision context. A complex model that invites scrutiny may not be needed to address a given problems.
- Several regional interview summaries mention the benefits of social and behavioral sciences, reflecting growing recognition of their importance.
- Regional offices voiced concern about using outdated science ("1980's science.") to support regulations and enforcement
- Interviewees often confounded data and science. There were few discussions about model assumptions
- Impression that few managers have science backgrounds

- Impression that Regions had few GS 14-15 scientists and that there was a limited career track for regional scientists
- Regions repeatedly communicated that they need more IRIS information, information on impacts of emerging contaminants, and more regional climate-related information from ORD.
- ORD's "good science" seems inaccessible to many regional scientists and, conversely, ORD feels inundated with requests for science support from regions, that seem fragmented, ill formed, and uncoordinated. The exception is Superfund, where requests have a context and responses are clear.
- Regions consistently expressed frustration with ORD's research planning process and many interviewees described ORD Science to Achieve Results (STAR) grant efforts as not relevant to their needs.
- Regional desire for more RARE funding differs from ORD's desire to keep limits on or reduce that program.
- Many regions reported concern that EPA has dis-invested in monitoring. The SAB may want to ask EPA about the priority of environmental monitoring in terms of EPA's mission.
- Regional scientists do not receive usable information about SAB and NRC reports that make recommendations relevant to science across the Agency. There is no training or "roll-out" of information or new approaches, comparable to the risk characterization training that followed publication of the "Red Book."

Members discussed potential recommendations for the committee's report. As context, they noted that ORD has multiple functions and that technical support for EPA regions is only one element of ORD's mission. The Environmental Research and Development Authorization Act of 1976 stated that research and development is an important part of EPA's mission. ORD must balance the development of new knowledge against meeting needs for application of scientific knowledge.

Members also discussed different views of the role of EPA's regions. Several members spoke of the central role of regions in implementing and enforcing most of EPA's policies and programs. One member, however, raised questions about the appropriate role of regions, given the importance of state environmental protection activities. He asked for information about the history and evolution of the role of EPA's regional offices.

Committee members also acknowledged the 2004 report, *Science in Regional Decision Making* (a.k.a., the "45-Day Study") and expressed the view that the SAB report should take a different approach for addressing regional science integration needs. Rather than providing a long list of recommendations, the SAB report should identify priority recommendations that will make a difference.

A member noted that regions are creative in finding routes to meet their science needs. EPA spends only 6% of the federal budget for environmental research. Regions have tapped relevant research in other federal agencies and should be commended,

In discussion potential recommendations, members made the following points:

- Provide strong reinforcement for the importance of regions, because of their core importance to EPA. Convey that EPA should have the highest standards for environmental protection and environmental science in regional offices. Otherwise, "environmental protection falls apart." EPA should promote the vision of scientific excellence in regions, with excellence defined as "quick, thoughtful, holistic" science that has full access to available data
 - Regions should have best practices networks along the model of Exxon's global regions, which set up networks of peers who interact electronically and occasionally meet face-to-face.
- Recommend that ORD examine how it should reorder its strategic and tactical activities to help regions do their best work. ORD might examine
 - How to facilitate data needed to inform regional decision
 - How to help regions populate models with data for a local decision
 - Partnering with universities that could contribute to a regional decision
 - How to better operationalize research and tools for regions
- Recommendations should help regions deal with practical problems. e.g., how to engage universities on a more systematic basis - so regional efforts will add up.
- Recommend either that EPA should give regions more resources or allow regions to focus and use resources better
- Recommend better communication that "respects regions' needs for information about research and research results" to inform decision making
- Recommend formation of "SWAT" teams to assist with integration of science to support regional decisions. SWAT teams could be composed of scientists across regions or regional and ORD scientists
- Clarify and improve the process for regional input into research planning
- Recommend that regions adopt a formal process for each region to conduct a "self-assessment" on an annual basis that would identify environmental issues to be addressed; the region's role; science needed; regional capacity; and science needs that must be met from sources outside the regions. ORD could then identify convergence of needs to help focus research planning.
- Recommend formalized retraining program that would advance scientists' education to the Ph.D. level and train scientists in newer science areas
- Recommend systematic appraisal of the effectiveness of stakeholder processes based on established evaluation methods that would allow EPA to improve use of stakeholder process for science integration over time
- Recommend that ORD connect STAR grant solicitations, updates, and rollout of research results with regional needs.
- Recommend that regions clearly identify the source of the science they use for decision making
- Recommend that regions have the ability to access outside expertise through use of expert scientists and engineers who are Special Government Employees

SAB members spoke of possible activities that might occur at the workshop to be planned to feature initial committee findings and recommendations. Members identified the following potential ideas:

- Feature creative solutions to science integration issues, successful efforts

- Feature effective information flow between program offices and regions and regions and ORD. The Office of Solid Waste and Emergency Response (OSWER) may provide examples. Consider comparisons with programs not working as well, possibly a program where the legislative mandate is not as clear

SAB members identified the following questions during the course of their discussions and asked that they be explored as a follow-up to the meeting:

1. Did EPA implement any of the recommendations in the 45-day study?
2. How many regional managers have science backgrounds?
3. What is the grade structure for scientists in the regions?
4. Many regions reported concern that EPA has disinvested in monitoring. What is the priority of environmental monitoring in terms of EPA's mission?
5. What is the history of EPA regions and their role? How has that history changed over time?
6. What have been the roles and activities of regional science councils? Have regional science councils inventoried their region's needs related to science integration?

3. Discussion of Discussion of key findings: Science integration for decision making in National Program Offices

Committee members identified key themes and findings from their discussions with EPA program offices. In doing so, they noted that the interviews did not include discussions with scientists and managers responsible for teams addressing cross-program, cross-media issues. A member pointed out that the interviews reflected only a limited picture of the views and experiences of program office scientists and managers. Given those caveats, key themes and findings from the interviews follow:

- Program office scientists voiced concern that they did not have promotion potential or opportunities for advancement as scientists.
- Institutional "stove pipes" separate program offices from each other and, as a result, the interviews have "less of a unifying theme" than regional interviews.
- Program silos create a barrier to addressing environmental problems before they're formed.
- Problem formulation seems to come from statute, without regard to physical, economic, social context of specific environmental problems.
- In some programs, the problem formulation seems to involve definition of needed science as the "legal minimum to withstand challenge," rather than whether there is sufficient scientific input that would lead to the best policy
- In other programs, such as the criteria air pollutant program, EPA has a "positive attitude;" the office is busy but embraces science in a well-developed way to inform setting of regulations
- Interviewees had three different kinds of reactions to the role of enabling legislation: 1) to view it as the limit of EPA's authority and not acknowledge problems outside the legislation's scope; 2) "to shrug and just say we'd like to do better, but the law doesn't allow it;" and 3) for the "less risk averse," to indicate their willingness to try different things

- OPPTS leadership spoke of a willingness to try new approaches
- Program offices in some case are more aware of and likely to use SAB and NRC recommendations than regional offices, because they see their science as applicable to EPA at large. Regional offices don't see their role in implementing the SAB and NRC recommendations, or don't have time, or view their responsibilities as mostly local.
- Program offices differ in their approaches to stakeholder involvement. The Superfund and pesticide program have repeated and well-developed processes for stakeholder involvement. Every program office uses formal stakeholder processes that involve notice and comment on rulemakings.
- Only one office (OAR) discussed how scientific assessments dealt with uncertainties in a quantitative way.
- EPA program offices spoke of the need for assessments to consider cumulative impacts, but efforts have been minimal.
- ORD has had a long-term effort to provide guidance for cumulative risks, but has not provided a final product.
- Ecological risk assessment may offer a model for considering cumulative risk in a decision-relevant way.

Members discussed potential recommendations for the committee's report. As part of that discussion, members noted that effective recommendations must provide some practical (i.e., "do-able, non-trivial, and effective) suggestions about how to address EPA's "silo problems" and other issues related to science integration for decision making. They challenged each other to identify recommendations that would not require additional resource investment. Members also noted that their report should acknowledge that integrated science is only one input for environmental decision making and that law, public opinion, and politics play a role. Members noted that it would be valuable to reference the Bipartisan Policy Committee's report (*Science for Policy Project: Final Report*, August 2009) and its recommendation that Agency communications draw clear distinctions between science, politics, and policy in describing Agency decisions. Dr. Vanessa Vu suggested that the committee's report clearly identify actions that the Administrator can take to promote science integration.

The committee discussed the following potential recommendations. The committee's report might:

- Point out that environmental statutes do not dictate an organizational system and often the law is "less constraining than what people believe." The committee's report could "take a few specific barriers people think they face and discuss organizational strategies around them."
- Discuss how place and problem formulation can be better integrated into policy and decision-making.
- Look for examples where problem formulation helped to identify a problem more effectively and allowed EPA to reach across organizational silos.
- Communicate that effective integration will take "years of disciplined work, supported by robust mechanisms and systems." Implementation beyond words requires a program and systems to support managers and staff.

- Leadership is key to the culture change required to break down organizational silos.
- The SAB report should recommend EPA to draw on management literature and approaches that helped industry break out of single-sector, single silo approaches.
- Recommendations for greater integration across statutes and program offices needs to be made "with force" because there are many countervailing forces: the structure of existing congressional committees and their oversight authority; stakeholders; political legacy of existing programs.
- Develop career ladders for managers and scientists that would foster integration. Managers should be expected to work in regions, ORD, and program offices. ORD scientists should work in programs and labs and program offices and laboratory scientists should have ORD experience.
- There are fewer senior scientist positions at EPA, compared to other federal agencies (e.g., National Institutes of Health, food and Drug Administration, and Centers for Disease Control),

SAB members spoke of possible activities that might occur at the workshop to be planned to feature initial committee findings and recommendations. Members identified the following potential workshop ideas:

- The workshop might include a discussion of ORD's new transdisciplinary research initiative and how it could relate to new processes for science integration supporting decision making in other parts of EPA
- The workshop could focus on changes in Government Performance and Results Act (GPRA) measurements to help EPA measure environmental improvements more effectively at the regional and program scales. A discussion of GPRA might help programs develop a different vision "of what they're trying to integrate in a decision and what performance is."
- The workshop could discuss structural initiatives in terms of incentives and organization to promote problem formulation and integrated use of science.
 - A session could attempt problem formulation for one or several major problems EPA faces and then discuss budgeting by problem or project, rather than by existing silos and disciplines, how organizations, regulatory programs, and non-regulatory programs would work together, and how science would be integrated
 - The global change issue might serve as an example
 - Workshop might also include a local example, e.g., Androscoggin River, Delaware bay
 - The Administrator's new approach for implementing the Safe Drinking Water Act might also provide a focus of interest for new opportunities for science integration.
- The workshop might explore the possibilities of providing EPA managers and scientists with career experience that would given them science integration insights from different perspectives.
- The workshop could feature a panel of EPA managers and senior scientists who worked on integrated efforts in the past (e.g., watershed efforts, place-based efforts) and who

would speak about the benefits of those efforts and barriers EPA needs to overcome to integrate science for decision making.

4. Discussion of key findings: Science integration for decision making in other offices supporting decisions

The discussion focused on findings and recommendations related to committee members' interviews with ORD scientists and managers. Committee members spoke of the importance of research for EPA. Universities often do not pursue research related to regulatory questions, and industry research is proprietary. ORD's role is to conduct research to inform the regulatory process and support programs and regions.

Committee members discussed key themes and findings from the interviews with ORD representatives:

- ORD scientists are "good scientists doing science in a pressure cooker," trying to meet time constraints and regulatory needs
- ORD needs capacity to do anticipatory research. ORD scientists wished they had previously conducted more research on sustainability and lifecycle assessment. ORD has lagged in research on these topics, compared to researchers outside EPA,
- ORD National Risk Management Research Laboratory's sustainable technology group is an exemplary interdisciplinary research team that could be featured in the committee's upcoming workshop
- ORD's National Program Directors try to facilitate science integration across laboratories and disciplines but are frustrated because they do not control resources.
- ORD laboratories currently look for projects that fit within their expertise and where they could "create the biggest bang," rather than having ORD research defined by Agency problems and the multi-disciplinary collaboration needed.
- ORD did not outline a systematic process for providing technical support to regions or have a clear message about the nature and amount of technical support appropriate to provide

Members discussed potential recommendations for the committee's report regarding the work of ORD.

- Recommend that ORD form a think tank to: 10 identify emerging science and the possible relationship of that science to EPA's mission and accelerate emerging science into Agency decisions (e.g., integrate lifecycle assessment into decisions, look for future analogues to lifecycle research; one possible area of such emerging science might be data mining)
- Recommend that ORD complement its internal 'Integrated Transdisciplinary Research Transformation' by enhancing relationships with "customers" who use ORD research
 - Recommend that ORD use tools similar to those used by industry managing change to survey clients, survey scientists about their customer focus, and hold managers accountable.

- Recommend that EPA plan for a long-term Agency-wide "Science Integration Transformation" that would complement ORD's "Integrated Transdisciplinary Research Transformation"
- Recommend that scientists across EPA, including ORD, take details or undertake other cross-training to strengthen understanding of the needs and roles of program and regional scientists.
- Recommend science education to strengthen communication of uncertainty and complexity to decision makers and the public.
- Recommend that ORD should consistently send the message that scientists and managers must engage both in long-term research and shorter-term technical support
- Recommend that ORD reach a clear decision about the appropriate balance between research and development and clearly communicate the process for programs and regions seeking technical support.
 - ORD should catalogue requests, analyze them, and identify appropriate information, tools and methods for toolkits that can address priority needs.
- Recommend that ORD should look across regions' annual listing of their science needs and work toward building "tools and methods kits" that can address priority needs
- Recommend that ORD take a leadership role in research on communicating scientific information and associated uncertainties and organize workshops on effective communication of this information.

5. EPA comment

Four regional scientists provided comments for the committee's consideration: Mr. Robert Hillger (Region 1), Mr. Thomas Baugh (Region 3), Mr. Michael Morton (Region 6), and Dr. Winona Victory, Region 9. They explained that ORD Liaisons receive salaries from ORD and report to regional managers. Regional staff expressed appreciation for the committee's fact-finding and discussions. One regional scientist commended the committee for its insights into the problems faced by regional scientists and managers. He noted the importance of "partnerships" with scientists in universities and other organizations when regional scientists find they lack scientific expertise to support a decision and cannot identify needed scientific support from ORD. He called for more opportunities to collaborate with ORD scientists for the benefit of the whole Agency. Other scientists spoke of regional competition for ORD RARE grants, given Agency needs and many worthy research proposals. He also spoke of the need for succession planning that would backfill behind retiring experienced scientists.

Dr. Mary Belefski from the Office of Prevention, Pesticides and Toxic Substances suggested that the committee consider including in its workshop an opportunity for EPA to hear about successful practices in other organizations (e.g., private industry, states, and academia) that foster integration across academic disciplines on complex scientific issues and successful collaboration on projects. Ms. Claudia Walters suggested that the committee gather information from ORD's National Center for Environmental Research about its efforts to supplement EPA expertise with grants for extramural research conducted by external scientific experts.

6. Discussion of additional fact-finding needs and preliminary recommendations

Members briefly discussed additional fact-finding needs related to the committee's charge. Members identified the following information needs:

- A sample of ORD's annual performance review form to understand how individual scientists are evaluated in terms of long-term research and technical support for regions and program offices..
- Information about the grade structure for scientists in the regions
- Regional responses to ORD annual requests for "success stories" related to the use of ORD research
- Any available Regional Science Councils lists of regional science needs
- Information about the progress of the ORD transformation effort, including a projected schedule and how ORD envisions the transformation will change its research portfolio
- A copy of the "Path Forward" memo from Dr. Paul Anastas to ORD Staff

The SAB Committee then held a brief discussion related to travel and training for regional scientists. Two regional scientists, Drs. Marian Olsen and Winona Victory provided information to the committee about the wide disparity in regional practices supporting travel for regional scientists. Region 2 scientists are fairly well funded for travel and training, while Region 9 scientists are now encouraged to reduce their carbon footprint and take training via Webinars.

Dr. Vanessa Vu noted that ORD's Scientific and Technological Achievement Awards program recognizes high quality research published in peer journals with a monetary award. EPA does not have a similar Agency monetary award, however, for scientific collaboration across EPA that contributes to Agency decision making.

Before recessing for the day, the committee discussed whether their discussions were appropriately focused on the charge to the committee, to evaluate scientific integration for decision making. The committee had focused on the source of decision makers' science and discussed ORD research planning, availability of ORD research results, and ORD technical support. A committee member asked whether the committee had adequately addressed other dimensions of the science integration issue. He suggested that the committee consider not only where decision makers get their science, but how that science is vetted, how it is integrated and how communicated. Dr. Vu noted that the Integrated Science Assessment developed by ORD to support the National Ambient Air Quality Standard review process is an Agency model for science integration. A regional scientist noted that EPA had developed an on-line Science Inventory for all Agency science work products, but the inventory is not populated, except for ORD information, and is difficult for regions to use.

The committee chair asked the DFO to provide members of the committee with a copy of the Committee's initial charge as background for discussion on March 31st. He asked Committee members to prepare thoughts about the structure and key components of the Committees' advisory report for discussion on March 31st.

The meeting recessed for the day at 5:40 p.m.

March 31, 2010

7. Continued discussion of initial findings and recommendations and preliminary design for a public workshop

The committee chair asked members to review the committee's initial charge (Attachment E) charge to identify points for additional discussion or possible additional fact-finding. The key language appears on page 3:

The new SAB study will evaluate the extent to which EPA's scientific assessment practices are integrated into environmental decision-making practices as previously recommended by the by the NRC and the SAB. The study will focus on EPA's application of scientific assessments in environmental decisions concerning chemical and microbial pollutants. The SAB will identify barriers to implementing NRC and SAB recommendations and suggest immediate and future actions that EPA could take to develop and institutionalize integrated environmental decision-making. Areas of consideration may include scientific leadership, scientific practices, scientific collaboration across disciplines, and scientific expertise and workforce. The SAB may also make additional recommendations, beyond those previously provided by the NRC and SAB, to improve the integration of EPA's scientific assessments for decision making.

The committee confirmed that the committee's preliminary study plan and fact-finding interviews had appropriately focused on the charge. Dr. Vu confirmed that it is appropriate for the committee to focus on environmental decisions broader than microbial and chemical pollutants.

Committee members noted that deliberations had not previously addressed interdisciplinary collaboration in any detail. Many of the interviews noted that program and regional offices did not include credentialed social scientists. It may be appropriate for the committee to address why EPA needs social science as part of the integrated science to support decision making and how EPA might improve collaboration among experts in different disciplines.

A committee member noted that it would be useful for the committee's report to illustrate how social science could contribute to environmental decision making, what kinds of expertise are needed and where. Since EPA is likely to be hiring new staff as aging scientists retire, there may be the opportunity to add social scientists to the work force. The committee may be able to illustrate the contributions of social scientists to problem formulation and decision making at different stages.

Another committee member noted that the ORD Assistant administrator, Dr. Paul Anastas, gave a keynote address focusing on sustainability at the American Chemical Society. The Science Integration Committee may find it useful to illustrate potential contributions social scientists can make in a transdisciplinary process to environmental protection decisions involving sustainability. Such sustainability decisions may become increasingly important as

American industries compete and market goods internationally. American industries will need to meet requirements of the Organization of Economic Cooperation and Development for green chemistry and lifecycle assessment and sustainability drivers for biofuel technologies. New interdisciplinary strengths in bioinformatics and data mining will also be needed.

SAB committee members talked about their vision to replace the "independent science silos" that dominate much of EPA scientific assessments. Members of the committees envisioned EPA scientists as not only retaining their strong disciplinary expertise but also working collaboratively in a systematic way. To connect independent silos, members envisioned an interactive system, like a "well-run, sustainable farm in a beautiful landscape." EPA should have a system that organized scientists to work collaboratively so they "play off each other and expand and enrich" EPA's scientific output and science-based decision making.

Members emphasized that they do not view EPA's science as weak or failing. Instead, they wished to send an urgent message that EPA must reconsider its organization and support for science to prepare for future challenges that will require collaborative approaches and new disciplines. The report should recommend changes that will maximize resources and should emphasize where EPA faces tradeoffs in implementing recommendations. A member noted that the report should focus on how the Agency can address some key issues (e.g., providing updated chemical assessments, providing science and technical support for regions) to illustrate the need for change. The report should challenge EPA to identify key priorities that will help guide problem formulation and the science assessments to follow.

The Committee chair noted that the purpose of the committee's planned workshop, likely to be scheduled in early fall, is to seek input from EPA and stakeholders on the committee's initial findings and recommendations.

8. Comments from the ORD Deputy Assistant Administrator for Science

Dr. Kevin Teichman provided some informal comments to the committee. He underscored the importance of EPA's overall scientific workforce of 6,000. ORD only has a workforce of 1,900; two-thirds of that ORD staff are scientists and engineers. He asked the committee to carefully consider science outside of ORD and integration of the scientific assessments presented to risk managers outside ORD. He noted that EPA has a publicly available Science Inventory, which has been only sporadically populated by scientists outside ORD. He asked the committee to consider how the Administrator and Assistant Administrators in Program Offices receive scientific information for decision makers. He noted that the Administrator involves the ORD Assistant Administrator when decisions are to be made; she asks whether the science presented by program offices were properly characterized. Dr. Teichman asked whether the committee has asked other decision makers whether they were well informed about decisions to be made or whether they could provide examples of where they were not.

He noted that much of the committee's discussion had focused on unmet needs in regional offices. Because of limited resources, there are always unmet needs, so the key question is whether the Agency is using existing resources effectively. He noted that ORD has recently

introduced a streamlined IRIS process and allocated more staff for IRIS assessments. He noted that ORD is providing Integrated Science Assessments for criteria pollutants and has introduced the on-line HERO database to facilitate updating assessments of criteria pollutants every five years. ORD is responding to regional needs for science with methods for addressing risks of mountain top mining, a study plan for hydraulic fracturing, and studies of regional implications of climate change. ORD has been responsive to regional requests for support for Libby asbestos, and PCBs in caulk. ORD has efforts underway to study nutrients in Florida, the lifecycle assessment of biofuels, ecosystem services, community risk, and new approaches for environmental justice. If the committee will ask ORD to assume additional research tasks, it will be helpful for it to identify areas to de-emphasize. He emphasized the ORD's Integrated Transdisciplinary Research Transformation has been endorsed by ORD's new Assistant Administrator. ORD is committed to working with stakeholders and clients and to providing science to support decisions to implement the Administrator's priorities.

Committee members responded with observations from their fact-finding interviews. They reflected regional concerns that science needs are not met. Although 50-60% of regional staff are scientists and engineers, many of them are not working in those fields and do not have the support or capacity to provide the science needed. Committee members noted that interviewees were courageous to identify areas where science needs to be strengthened for decisions in regional and program offices and that regional scientists and managers are seeking help in the absence of information. Committee members noted that they had spoken with Regional Administrators, Acting Regional Administrators, or Deputy Regional Administrators in all 10 regions, and had interviewed the OSWER Assistant Administrator and OPPTS Deputy Assistant Administrator and received a briefing from the OW Deputy Assistant Administrator.

A committee member asked how ORD will hold itself accountable and on what time frame for implementation of the directions described in the *Path Forward* memorandum. Dr. Teichman responded that the memorandum anticipates that FY 2012 budget decisions will be affected by the new directions described. Another member asked about ORD's vision for the appropriate balance between research and applied science support for regions and program offices and how applied science support was prioritized and worked into ORD's workflow. Dr. Teichman responded that quantifying technical support is difficult, but ORD does operate technical support centers. In general, ORD tries to provide technical support for topics where ORD can gain new knowledge that can be useful to other environmental problems.

Dr. Teichman also noted that ORD has for several years changed its requirements for technical qualifications boards that decide promotions in ORD. To promote teamwork, ORD no longer penalizes scientists for being a second or third author on a report and has included a program or regional representative on the panel. One of the criteria for promotion requires that a scientist's work must make a difference for a program or region. He also noted that ORD has sponsored an exchange program between programs and regions, which has worked well to bring regional scientists to ORD laboratories, but has not worked equally well to bring ORD staff to regional offices.

9. Discussion of a straw outline for the Committee's report

The committee discussed the following outline

Executive summary

Introduction

- reference existing documents, (SAB Toward Integrated Environmental Decision Making, NRC Silver Book); describe focus of this report - integrating science assessment to support decision making
- frame why request was made - Initial concern in 2009 was that science sometimes does not get to the table when request was made. In 2010, the environment for science is changing. Build on/respond to the "Path Forward" memo; identify what needs to be done across EPA to make "integration" happen. Emphasize practical nature of recommendations, assume no new resources
- describe the "niche" for the report, which addresses how science integration happens. Acknowledge that there sometimes a gap between nominal approaches "how EPA officially describes science integration" and actual approaches "how EPA offices really do it " The Report will describe actual practices, evaluate them, and make suggestions for things that will can do better that will have a significant impact

Charge and approach to charge

Science to inform decisions

- characterize capacity of EPA, describe available resources and organization; need for scientific information (data, methods, tools)
 - Need for scientists with capacity who can handle information in context
 - Need for process for integrating science
 - Need for leadership culture that fosters science integration and a process for evaluating science integration
- characterize nominal system
- committee's approach: focus on practice (actual system)
- starting with decisions describe pyramid of decision making (from base with permit-writer or branch chief making decisions to Administrator)

Characterize major aspects of Science Integration for Decision Making practice

Acquisition of science by EPA

Evaluation of science

Integration of science

Communicating science - to decision-makers, to stakeholders

For each...

- highlight major differences between practice and nominal system;
- comment on these differences,
- provide boxes with examples of good examples
- make a few major recommendations
 - keep recommendations be specific
 - don't assume one size fits all/don't be too prescriptive
- look for opportunities for science (and policy) at one level to affect science (and policy) at other levels either from the bottom up or top down

The report would include discussions of capacity building and strengthening EPA's science base. Members envisioned that the report would be short (no more than 30 pages with a

one-and-a half -page Executive Summary). The report should feature key examples to make major points.

10. Identification of next steps

The committee Chair asked the DFO to document the outline developed by committee members and to work with him to suggest assignments to four or five small groups to develop draft text. The Chair noted that he would work with the DFO to develop a straw proposal and outline for the workshop, based on the committee's deliberations. The DFO will propose a schedule for two teleconferences to discuss draft text that would provide input for the workshop and evolve into key components of the committee's report.

Adjourn the Meeting

The Designated Federal Officer adjourned the meeting at 1:30 p.m..

Respectfully Submitted:

Certified as True:

/Signed/

/Signed/

Dr. Angela Nugent
SAB DFO

Dr. Thomas Burke
Chair, SAB Committee on Science
Integration for Decision Making

ATTACHMENTS

- Attachment A: Committee Roster
- Attachment B: Agenda
- Attachment C: FR Notice
- Attachment D: Members of the Public and EPA Representatives who requested call-in information or asked to be identified as participating in the teleconference.
- Attachment E: Improving EPA Scientific Assessment Practices for Decision Making, SAB Charge for a New Study

Attachment A
U.S. Environmental Protection Agency
Science Advisory Board
Committee on Science Integration for Decision Making

CHAIR

Dr. Thomas Burke, Professor, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD

MEMBERS

Dr. John Balbus, Senior Advisor for Public Health, National Institute of Environmental Health Sciences, Bethesda, MD

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

Dr. James Bus, Director of External Technology, Toxicology and Environmental Research and Consulting, The Dow Chemical Company, Midland, MI

Dr. Deborah Cory-Slechta, Professor, Department of Environmental Medicine, School of Medicine and Dentistry, University of Rochester, Rochester, NY

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

Dr. T. Taylor Eighmy, Vice President for Research, Office of the Vice President for Research, Texas Tech University, Lubbock, TX

Dr. Penelope Fenner-Crisp, , Independent Consultant, North Garden, VA

Dr. John P. Giesy, Professor and Canada Research Chair, Veterinary Biomedical Sciences and Toxicology Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

Dr. Rogene Henderson, Senior Scientist Emeritus, Lovelace Respiratory Research Institute, Albuquerque, NM

Dr. James H. Johnson, Professor and Dean Emeritus, College of Engineering, Architecture & Computer Sciences, Howard University, Washington, DC

Dr. Catherine Kling, Professor, Department of Economics, Iowa State University, Ames, IA

Dr. Wayne Landis, Professor and Director, Department of Environmental Toxicology, Institute

of Environmental Toxicology, Huxley College of the Environment , Western Washington University, Bellingham, WA

Dr. Jill Lipoti, Director, Division of Environmental Safety and Health, New Jersey Department of Environmental Protection, Trenton, NJ

Dr. Gary Saylor, Beaman Distinguished Professor, Joint Institute for Biological Sciences, Oak Ridge National Laboratory, University of Tennessee, Knoxville, TN

Dr. Thomas L. Theis, Director, Institute for Environmental Science and Policy, University of Illinois at Chicago, Chicago, IL

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

Dr. Lauren Zeise, Chief, Reproductive and Cancer Hazard Assessment Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Oakland, 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
Meeting Agenda**

**Meeting of the Science Advisory Board (SAB) Committee on Science Integration for
Decision Making
Woodies Building, 1025 F Street, N.W., SAB Large Conference Room, Room 3705
Washington, DC 20004
March 30-31, 2010**

Purpose: to discuss the results of fact-finding activities conducted as part of a study of science integration supporting EPA decision making and to discuss the Committee's next steps.

March 30, 2010

8:30 - 8:40	Welcome	Dr. Angela Nugent, Designated Federal Officer, SAB Staff Office Dr. Vanessa Vu, Director, SAB Staff Office
8:40 - 8:50	Introduction of members and review of agenda	Dr. Thomas Burke, Chair
8:50 - 10:30	Discussion of key findings: Science integration for decision making in Regional Offices	Committee
10:30 - 10:45	Break	
10:45 - 12:15	Discussion of key findings: Science integration for decision making in National Program Offices	Committee
12:15 - 12:30	Public comment	TBA
12:30 - 1:30	Lunch	
1:30 - 3:00	Discussion of key findings: Science integration for decision making in other offices supporting decisions	Committee

3:00 - 3:15	Break	
3:15 - 4:15	EPA Comment	TBA
4:15 - 5:00	Discussion of additional fact-finding needs and preliminary recommendations	Committee
5:00 - 5:30	Summary and discussion of agenda for March 31	Dr. Thomas Burke
5:30	Adjourn	

March 31, 2010

8:00 - 8:05	Opening of Meeting	Dr. Angela Nugent, EPA, SAB Staff Office
8:05 - 10:00	Continued discussion of preliminary recommendations	Dr. Thomas Burke Committee discussion
10:00 - 10:15	Break	
10:15 – 11:30	Discussion of purpose and design for workshop	Dr. Thomas Burke Committee discussion
11:30 -- 12:00	Public or Agency Comment	TBA
12:00 - 1:00	Lunch	
1:00 – 2:00	Discussion of next steps	Dr. Thomas Burke
2:00	Adjourn	

Attachment C
FR Announcement

[Federal Register: March 4, 2010 (Volume 75, Number 42)]
[Notices]
[Page 9895]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr04mr10-59]

[[Page 9895]]

ENVIRONMENTAL PROTECTION AGENCY

[FRL-9122-2]

Science Advisory Board Staff Office; Notification of a Public Meeting of the Science Advisory Board; Committee on Science Integration for Decision Making

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: The Environmental Protection Agency (EPA or Agency) Science Advisory Board (SAB) Staff Office announces a public meeting of the SAB Committee on Science Integration for Decision Making.

DATES: The meeting dates are March 30, 2010 from 9 a.m. to 5 p.m. and March 31, 2010 from 8:30 a.m. to 1 p.m. (Eastern Time).

ADDRESSES: The meeting will be held in the Science Advisory Board Conference Center, 1025 F Street, NW., Suite 3705, Washington, DC 20004.

FOR FURTHER INFORMATION CONTACT: Members of the public who wish to obtain further information about this meeting must contact Dr. Angela Nugent, Designated Federal Officer (DFO). Dr. Nugent may be contacted at the EPA Science Advisory Board (1400F), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460; or via telephone/voice mail; (202) 343-9981; fax (202) 233-0643; or e-mail at nugent.angela@epa.gov. General information about the EPA SAB, as well as any updates concerning the public meeting announced in this notice, may be found on the SAB Web site at <http://www.epa.gov/sab>.

SUPPLEMENTARY INFORMATION: Pursuant to the Federal Advisory Committee Act (FACA), 5 U.S.C., App. 2, notice is hereby given that the SAB Committee on Science Integration for Decision Making will hold a public meeting to discuss the results of fact-finding activities conducted as part of a study of science integration supporting EPA decision making. The SAB was established pursuant to 42 U.S.C. 4365 to provide

independent scientific and technical advice to the Administrator on the technical basis for Agency positions and regulations. The SAB is a Federal Advisory Committee chartered under FACA. The SAB will comply with the provisions of FACA and all appropriate SAB Staff Office procedural policies.

Background: The SAB Staff Office has rescheduled the meeting of the Committee for Science Integration for Decision Making previously announced for February 10-11, 2010 (see 75 FR 2542-2543) and rescheduled because of adverse weather conditions in the Washington, DC area.

The goal of the committee is to develop an original study that provides recommendations to support and/or strengthen Agency's ability to integrate science to support decision making. The purpose of the meeting will be to discuss the results of the committee's fact-finding discussions with EPA program and regional offices concerning their current and recent experience with science integration. The committee will also determine next steps to complete the evaluative study. Additional information on the study and the committee's activities meeting may be found on the SAB Web site at http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr_activites/Science%20Integration?OpenDocument.

Availability of Meeting Materials: The agenda and other material in support of this upcoming meeting are posted on the SAB Web site at <http://www.epa.gov/sab>.

Procedures for Providing Public Input: Interested members of the public may submit relevant written or oral information on the topic of this advisory activity for the SAB to consider during the advisory process. Oral Statements: In general, individuals or groups requesting an oral presentation at a public meeting will be limited to three minutes per speaker, with no more than a total of one hour for all speakers. Interested parties should contact Dr. Nugent, DFO, in writing (preferably via e-mail) at the contact information noted above, by March 24, 2010 to be placed on a list of public speakers for the meeting. Written Statements: Written statements should be received in the SAB Staff Office by March 24, 2010 so that the information may be made available to the SAB committee members for their consideration. 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). Submitters are requested to provide two versions of each document submitted with and without signatures, because the SAB Staff Office does not publish documents with signatures on its Web sites.

Accessibility: For information on access or services for individuals with disabilities, please contact Dr. Nugent at the phone number or e-mail address noted above, preferably at least ten days prior to the meeting to give EPA as much time as possible to process your request.

Dated: February 25, 2010.
Anthony F. Maciorowski,
Deputy Director, EPA Science Advisory Board Staff Office.
[FR Doc. 2010-4537 Filed 3-3-10; 8:45 am]
BILLING CODE 6560-50-P

Attachment D: Members of the Public and EPA Representatives participating.

Mary Belefski, Office of Prevention, Pesticides, and Toxic Substances
Thomas Baugh, Region 4,
Julie Fitzpatrick, ORD
Noha Gaber, Office of the Science Advisor
Fred Hauchman, ORD
Ronald Landy, EPA
Michael Loughran, ORD
Jayne Michaud, EPA
Michael Morton, Region 6
Marian Olsen, Region 2
Patti Tyler, Region 8
Marilyn Tenbrick, ORD
Kevin Teichman, ORD
Winona Victory, Region 9

**Attachment E: Improving EPA Scientific Assessment Practices for Decision Making, SAB
Charge for a New Study**

Improving EPA Scientific Assessment Practices for Decision Making

SAB Charge for a New Study

Effective human health and environmental protection requires a strong foundation of scientific knowledge and EPA therefore uses many kinds of scientific assessments for policy analysis and decision making. EPA decisions about managing risks to human health and the environment are supported by human health and ecological risk assessments, socioeconomic analyses, and other kinds of environmental assessments. Examples of such EPA decisions include determining permissible release levels of toxic chemicals, granting permits for hazardous waste treatment options, and selecting methods for remediating Superfund sites. To ensure that EPA's assessments use the best appropriate available science and meet the increasingly complex information needs of decision makers, the Agency has requested that the Science Advisory Board undertake a study of how EPA can strengthen scientific assessment practices for environmental decision making (attached memorandum from EPA Administrator to SAB Chair, October 20, 2008).

As discussed below, previous studies conducted by the Science Advisory Board (SAB) and the National Research Council (NRC) have found that improvements in EPA's risk assessment and decision making processes are needed to ensure that the best and most relevant information is available for use in decision making. This new SAB study will build upon findings and recommendations of these previous studies.

SAB Report, *Toward Integrated Decision-Making*

In the report, *Toward Integrated Environmental Decision-Making* (EPA Science Advisory Board, 2000) the SAB found that an integrated approach to decision making is needed to effectively address new and complex environmental problems. The SAB noted that such an integrated approach involves a holistic assessment of environmental problems that incorporates traditional human health and ecological science assessments, socioeconomic analyses, use of decision science tools, and methods for assessing cumulative risk. The SAB proposed that EPA adopt a three-phased approach to risk assessment and decision making. In phase I (problem formulation), EPA would conduct preliminary analyses to compare risks and establish goals, and also conduct preliminary analyses of risk reduction options. In phase II (analysis and decision making), EPA would conduct an in-depth analysis of risks and projected risk reduction under possible management scenarios. A preferred risk reduction option, or set of options, would then be selected based upon criteria such as feasibility, cost-effectiveness, seriousness of risks addressed, and equity. In phase III (implementation and performance evaluation), preferred management options would be implemented, and environmental results would be monitored and evaluated. Such monitoring would provide feedback needed to modify and adapt management approaches as necessary. The SAB suggested that the proposed framework would help EPA decision makers consider the trade-offs required to achieve multiple, often competing goals, and select appropriate risk management options.

SAB Advice on Advancing the Science and Application of Ecological Risk Assessment in Environmental Decision Making

In the report, *Advice to EPA on Advancing the Science and Application of Ecological Risk Assessment in Environmental Decision Making: A Report of the U.S. EPA Science Advisory Board* (U.S. EPA Science Advisory Board, 2008), the SAB found that EPA could advance the practice of ecological risk assessment for use in decision making by developing new methods and tools to consider such issues such as temporal and spatial scale, biological complexity, and cumulative risk. The SAB also found that the practice of ecological risk assessment could be advanced by: 1) encouraging problem formulation dialogue between ecological risk managers, assessors, and stakeholders, and considering specific management alternatives during problem formulation; 2) linking specific testable hypotheses and questions to management information needs, data collection, and analysis; 3) aligning decision and supporting risk and economic analyses with “what matters to people” by increasing the understanding of and capacity to utilize ecosystem valuation methods in conjunction with decisions; 4) identifying uncertainties that may affect the quality of risk management decisions, and addressing uncertainty in a manner that allows trade-offs in risk management alternatives to be evaluated and communicated to the public; and 5) initiating post-decision audit programs to evaluate the environmental outcomes of risk-based decisions.

National Research Council Report, *Science and Decisions: Advancing Risk Assessment*

In the 2008 report, *Science and Decisions: Advancing Risk Assessment* (National Research Council, 2008) the NRC found that EPA needed a more coherent, consistent, and transparent risk assessment process to address the complexities of current problems and potential decisions, and ensure that the best available options for managing risks are considered. The NRC provided the following key recommendations to strengthen the risk assessment process.

- To improve the utility of risk assessments, EPA should adopt a three-phased framework for risk-based decision making. In phase I (enhanced problem formulation and scoping) available risk-management options would be identified. In phase II (planning and assessment) risk assessment tools would be used to determine risks under existing conditions and under potential risk management options. In phase III (risk management), risk and nonrisk information would be integrated to inform choices among options and make decisions.
- EPA should focus increased attention on the design of risk assessments (e.g., planning, scoping, and problem formulation) to ensure that assessments are more useful to and better accepted by decision makers. In this regard, the NRC recommended that risk assessments include a design stage that is more aggressively focused on informing decisions. The NRC specifically recommended more effective consideration of the potential for risk assessment processes to contribute to unintended consequences such as delays in risk-based decisions that may prolong exposure to risk, and divert attention

away from other important risks within EPA's mandate. In addition, the NRC recommended consideration of the potential for uninformed risk-risk substitutions.

- EPA should address a number of institutional and management issues in order to improve risk assessments. The issues include: 1) the need for proactive identification of studies and data that are most relevant to current risk assessment needs and effective communication of the need for such studies to the research community; 2) hiring needs for additional staff in fields such as epidemiology and quantitative uncertainty analysis important to improving EPA's scientific assessments, and ways to attract and retaining technical staff in these areas; 3) the need to establish and maintain risk assessment and decision-making training programs for scientists and managers responsible for risk assessment activities; 4) the need to expand EPA interoffice and interagency collaboration on risk assessments that support decision making and reduce the effects of compartmentalization resulting from EPA's organization around diverse statutory mandates; 5) the need to expand the scientific and decision-making core in the Agency's regional offices to ensure that they have the capacity to use improved risk-assessment methods to meet obligations for interaction with stakeholders, local agencies, and tribes; and 6) the need to effectively implement existing risk assessment guidelines, revise existing guidelines, and issue supplemental guidance as well as new guidelines.
- EPA should improve the characterization and communication of uncertainty and variability in all key computational steps of risk assessments. In this regard, the NRC recommended that EPA adopt a tiered approach for selecting the level of detail used in uncertainty and variability assessment.

Proposed New SAB Study

The new SAB study will evaluate the extent to which EPA's scientific assessment practices are integrated into environmental decision-making practices as previously recommended by the NRC and the SAB. The study will focus on EPA's application of scientific assessments in environmental decisions concerning chemical and microbial pollutants. The SAB will identify barriers to implementing NRC and SAB recommendations and suggest immediate and future actions that EPA could take to develop and institutionalize integrated environmental decision-making. Areas of consideration may include scientific leadership, scientific practices, scientific collaboration across disciplines, and scientific expertise and workforce. The SAB may also make additional recommendations, beyond those previously provided by the NRC and SAB, to improve the integration of EPA's scientific assessments for decision making.

To conduct this study, a new *Ad Hoc* Committee will be formed under the auspices of the SAB. The Committee will be comprised of selected members of the chartered SAB and Standing Committees. The Committee may be organized in subgroups to address different kinds of scientific assessments conducted by the EPA (e.g., human health risk assessments, ecological risk assessments), and/or different kinds of environmental decisions under various EPA programs. The Committee will be chaired by a member of the chartered SAB and supported by a team of SAB staff serving as Designated Federal Officers.

The Committee will hold an initial public meeting to develop a study plan. Subgroups of the Committee will hold informal discussions with EPA offices to conduct fact finding and gather background information as needed. The Committee will conduct a public workshop to seek input from EPA representatives, stakeholders, and interested members of the public and formulate its findings and recommendations. Following the workshop the Committee subgroups will prepare sections of the Committee’s advisory report. The Committee will then hold a public meeting to discuss the subgroup findings and prepare its draft advisory report. The Committee’s draft report will be then submitted to the chartered SAB for a quality review and approval at a public meeting.

Project Time Frame

Milestone	Approximate Time to Complete Milestone
1. Development of the SAB Proposal.....	February - May, 2009
• Approval of Proposed new SAB study	
• Formation of Committee	
2. Development of Committee Study Plan	June - July, 2009
3. Fact Finding and Planning for Public Workshop	August – December, 2009
4. Conducting a Public Workshop.....	January, 2010
5. Development of Public Draft of Advisory Report.....	February - March, 2010
6. SAB Quality Review of the Committee Report.....	April - May, 2010
7. Publication of SAB Report.....	June, 2010

References

National Research Council. 2008. *Science and Decisions: Advancing Risk Assessment*. National Academies Press, Washington D.C. [Available at: http://books.nap.edu/openbook.php?record_id=12209&page=R1]

U.S. EPA Science Advisory Board. 2000. *Toward Integrated Environmental Decision-making*. EPA-SAB-EC-00-011. U.S. EPA Science Advisory Board, Washington, D.C. [Available at: [http://yosemite.epa.gov/sab/sabproduct.nsf/D33811633594B9D78525719B00656478/\\$File/ecirp011.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/D33811633594B9D78525719B00656478/$File/ecirp011.pdf)]

U.S. EPA Science Advisory Board. 2007. *Advice to EPA on Advancing the Science and Application of Ecological Risk Assessment in Environmental Decision Making: A Report of the U.S. EPA Science Advisory Board*. EPA-SAB-08-02. U.S. EPA Science Advisory Board, Washington, D.C. [Available at: [http://yosemite.epa.gov/sab/sabproduct.nsf/7140DC0E56EB148A8525737900043063/\\$File/sab-08-002.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/7140DC0E56EB148A8525737900043063/$File/sab-08-002.pdf)]



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 20 2008

THE ADMINISTRATOR

MEMORANDUM

SUBJECT: Request for a Science Advisory Board Study

TO: Dr. Deborah Swackhamer
Chair, Science Advisory Board

At the U.S. Environmental Protection Agency, sound decision-making depends on getting the best available science. During its 30-year history of advising EPA Administrators, the Science Advisory Board has emphasized the need for anticipating future environmental threats and investing in emerging research and science critical for informing decisions. As our understanding of complex environmental problems improves, integrated approaches for delivering the best science need to be developed and implemented.

The SAB's 2000 report *Toward Integrated Environmental Decision-Making* suggested an integrated decision-making framework for evaluating and responding to environmental problems. I ask that the SAB initiate a study that builds on its 2000 study to develop independent advice on how EPA can strengthen scientific assessments for decision making. The SAB might consider EPA's organizational structure and functions in light of how they influence the development and application of science assessments in different decision-making contexts. It would also be valuable for the SAB to recommend how to strengthen EPA's approaches for integrating traditional human health and ecological science assessments with socioeconomic analyses, decision sciences, and technology development and assessments to better support policy development. Finally, as EPA continues to plan for human capital needs, I would like the SAB to provide advice on ways to attract and retain the best diverse technical workforce.

Attached is a brief description of the proposed study. Please feel free to tailor the scope and depth of the study as appropriate. I ask the study be completed in a timely manner for the next EPA Administrator's consideration and implementation.

A handwritten signature in black ink, appearing to read "S. L. Johnson".

Stephen L. Johnson

Attachment

Effective human health and environmental protection requires a strong foundation of scientific knowledge. Scientific information often includes considerable uncertainty resulting in a diversity of scientific interpretations. The development and application of scientific knowledge in identifying potential threats, characterizing risks, formulating technological solutions, and evaluating the benefits and costs of U.S. Environmental Protection Agency actions are major science functions at EPA. The scope and depth of such science assessments greatly vary under different legislation and policies.

These functions are carried out by scientists, engineers, and economists with specialized program knowledge. They, in turn, rely on technical support by outside experts procured through Agency's interagency agreements or contracts. In addition, EPA's National Center for Environmental Assessment in the Office and Research Development develops technical assessments for EPA's Integrated Risk Information System which are used throughout the Agency. Summaries of the potential human health effects information that may result from exposure to chemicals in the environment, along with the supporting Toxicological Reviews, are made available electronically on IRIS for use by EPA, states, and tribal governments.

Over the years, reports from the National Research Council, the General Accountability Office, and other organizations point out that, while EPA has knowledgeable experts, the Agency's policies and regulations are too often perceived to lack a strong scientific foundation and EPA's science is of uneven quality. To address these issues, EPA established several science coordinating bodies. For instance:

- the Risk Assessment Forum consists of Agency senior scientists that develop Agency-wide technical guidelines for human health risk assessment, ecological risk assessment, and exposure assessment;
- the Science Policy Council develops Agency position papers on cross-cutting and emerging issues (e.g. peer review practices, data quality guidelines, genomics, nanotechnology); and
- the Council on Regulatory Environmental Modeling guides the development and use of environmental models.

Staff support for these coordinating bodies is now centralized in the newly created EPA Office of the Science Advisor. In addition to these groups, the National Regional Science Council promotes communication and collaboration of regional scientists to identify common regional needs.

Nonetheless, scientists, engineers, economists, and other technical professionals, by necessity, continue to be spread throughout the Agency and have limited opportunity to interact with their peers in other organizational units. Such segregation can result in duplication of effort as well as conflicting scientific approaches to the evaluation of similar environmental agents by different offices. While the Agency has tried to minimize such occurrences through its science and science policy coordinating bodies, existing coordination processes can be slow and tend to occur in the later phases of assessment development and approval. Furthermore, the environmental problems of today are more complex, often cross state and national boundaries, and require consideration of difficult trade-offs and integration of socioeconomic and technological solutions. EPA's existing science and science policy coordinating bodies primarily address immediate scientific needs of the Agency and may miss a longer-term strategic viewpoint.

Proposal

The SAB has provided scientific advice and recommendations to the Agency on a wide variety of scientific issues for more than 30 years. Because of the SAB's unique perspective, it would be of value for the SAB to evaluate the Agency's current organizational structures and functions concerning the development and application of science assessments in different EPA decision-making contexts. The evaluation would result in advice and recommendations on how the Agency might strengthen scientific assessments, communication of uncertainties of the assessments, and how the results are used. Areas for consideration may include: scientific leadership; consistent scientific practices; scientific collaboration within and between disciplines; and multi-disciplinary approaches for integrating natural science assessments with economic and social science assessments.