

**Summary Minutes of the Science Advisory Board Meeting
May 11-12, 2005, Region 6 Headquarters Office, 1445 Ross Avenue,
Dallas, TX**

Board Members: See Roster – Attachment A.

Date and Time: Wednesday, May 11, 2005, 8:30 A.M. – 5:30 P.M. and Thursday, May 13, 2005, 8:30 A.M. – 10:00 A.M.

Location: Region 9 Headquarters Building, 1445 Ross Ave., Dallas, TX

Purpose: The purpose of this meeting was for the Board to:
a) learn of, and discuss science issues and needs with EPA Region 6 personnel; and
b) to consider two draft reports for approval.

See Attachment B for the meeting agenda and Attachment C for the Federal Register notice for the meeting.

Attendees:

Chair: Dr. Granger Morgan

Board Members:

Dr. Gregory Biddinger

Dr. James Bus

Dr. Trudy Cameron

Dr. Deborah Cory-Slechta (5/12 only)

Dr. Virginia Dale

Dr. Kenneth Dickson

Dr. James Galloway

Dr. Stephen Heeringa, Liaison, FIFRA SAP

Dr. Rogene Henderson

Dr. Phillip Hopke

Dr. Roger Kasperson

Dr. Catherine Kling

Dr. George Lambert

Dr. Gene Matanoski

Dr. Michael McFarland

Dr. Rebecca Parkin

Dr. Kristin Shrader-Frechette

Dr. Deborah Swackhamer

Dr. Thomas Theis

Dr. Robert Twiss (telephone, 5/12; 8:30-9:30 AM only)

Dr. Terry Young

Others attending: See Sign in Sheets (Attachment D)

Meeting Summary

The discussion generally followed the issues and general timing as presented in the meeting Agenda (Attachment C).

Wednesday, May 11, 2005

1. Introductory Remarks and Welcome

Mr. Thomas Miller, Designated Federal Officer (DFO) for the Board opened the meeting and noted that the meeting was being conducted pursuant to the Federal Advisory Committee Act, and other relevant statutory and policy requirements. Dr. Vanessa Vu welcomed the members and noted the importance of the topics to be discussed. Dr. Morgan welcomed and thanked the members for coming. He briefly reviewed the agenda.

2. Use of Science in Region 6 Decision Making:

a) Introduction to Region 6 Programs and Issues: Mr. Lawrence Starfield, Deputy Regional Administrator, Region 6, welcomed members and noted his appreciation of the SAB's assistance to EPA. Region 6 is large and diverse including activities ranging from petrochemical industrial production, to cattle ranching and other agriculture. The Region is often in the position of looking for local solutions that work in the situation of interest and not seeking a "DC solution."

Examples of challenges faced by Regional staff include: cleaning the air around the Houston ship channel, the Gulf of Mexico hypoxic zone, reconciling competing scientific views about specific issues by bringing differing proponents together to work on solutions, the need to solve problems in the immediate future and not over a protracted timeframe (e.g., Space Shuttle response and debris recovery, homeland security), and communicating science to citizens who have a variety of views on specific issues. Mr. Starfield sees exciting scientific and technological applications coming into play as we move to the future.

SAB Members comments and questions included:

- i) The Regions experience in obtaining needed research from ORD.
- ii) The use of new technologies in solving the hypoxic zone problem (the need is more for collaboration than for more technology though technology will be a help determine the extent of the problem and how to manage it).
- iii) The extent of collaboration, e.g., is there a "river commission" as we see in many other areas (no, though the Office of Water has a Hypoxia Workgroup).

b) Mr. Myron Knudson, Senior Policy Advisor for Region 6, discussed the **needs of the States in Region 6** (see Attachment E). He noted that the Regional Office often provides technical advice to states on specific environmental issues. State requests for assistance include:

- i) Water media – nutrient criteria and impacts, mercury in surface waters/fish, TMDL process for low dissolved oxygen;
- ii) Real-time monitoring capabilities – pathogens and highly reactive VOCs in air and bacteria/nutrients/algae/etc in water;
- iii) Drinking water – technical assistance for small public water supply systems (arsenic especially);
- iv) Groundwater – improvements to the Johnson & Ettinger model for vapor intrusion, prediction of groundwater plumes in housing developments, and individual home treatment systems;
- v) Soils – ability to renovate wastewater for varying depths of leach lines;
- vi) e-Government – a way to use electronic discharge monitoring reports, National Environmental Information Network (a Region 6 development for rapid retrieval of information); and
- vii) Technology verification processes – New technology controls in support of State Implementation Plans.

SAB Members questions and comments included:

- i) What types of international activities are being pursued (two major examples were given – air pollution and sewage treatment in Matamoros)?
- ii) How is the Mexico Boarder effort organized (The boarder is divided into four regions two of which are in Region 6 – committees meet three times a year and subcommittees meet on specific issues as needed); and
- iii) What success is EPA having working with other Federal agencies? (many examples were noted: DOD on many issues, especially base closure; quarterly meetings with USDI; DOE on past Los Alamos radiation disposal; USGS; ATSDR; USFS, and USDA).

c) Overview of Regional Science Structured, Regional Science Council, and Science Needs: Mr. Michael Callahan, Senior Science Advisor (see Attachments F1 and F2). Mr. Callahan discussed the Regional Science Council and its prominent role in Region 6's science program. Many Regional science issues requiring quick response are addressed and assisted by the RSC. The RSC for Region 6 has a number of subgroups that each focus on a specific issue, including: 1) Emerging Issues and Outreach (allow scientists to discuss emerging issues, status of their current projects, science issues, and maintain communications links); 2) Research Issues and ORD Interface (provides recommendations for RO management on annual RARE funded projects—which are funded through ORD at \$200,000 per year, fosters an enhanced relationship between the Region and ORD, and provides training on RARE proposals); Conferences and Workshops (sponsors and hosts conferences and workshops at the Regional Office and provides active coordination of pure science

internal conferences); 3) Scientific Expertise (explores areas where improvements can be made in science-based decisions and expands on general awareness of Region 6 science endeavors); and 4) University Interactions (facilitates interactions among Region 6 scientists and university faculty/students, builds partnerships).

Emerging issues that have been discussed are nanotechnology, hypoxia in the Gulf of Mexico, water availability in the U.S. West, and indoor mold exposure. Recent RARE projects for Region 6 include the development of an eco-region map for their area of responsibility and air monitoring). The Science Expertise group has provided judges for many science fairs in the region and participated in the 45-Day Science Review for Region 6 (see Attachment F2 on how science is used in Regional Decision making for Region 6).

SAB Members questions and comments included:

- i) What research resource levels could the Regional Office use for its actual needs (easily twice the now available through RARE which is now \$200,000 per year. Mr. Callahan noted that the RARE program had grown as the years had gone by (originally \$50,000) and that growth reflected regional needs.
 - ii) Does the Regional science program work on research with industry? (Have not done much of this yet but there is interest).
 - iii) With budgets continually constricting there seems to be a tendency to focus efforts on “legacy” issues. Have you identified specific legacy issues that could be addressed more efficiently through improvements in science, and would those changes free up resources for new issues? (A significant improvement that seems to be needed is to address risk assessment practices which are becoming substantially more complicated and time consuming. We need to consider what risk assessment changes might be needed in the future to address these issues.)
 - iv) Does the RSC have the charge to look at emerging issues for Region 6? (Yes. The Regional office is holding a workshop on this soon.)
- d) **Pathogen Indicators in Recreational Waters and Other Emerging Issues:** Mr. Mike Schaub, Watershed Management Section, Region 6, discussed the Region’s approach and needs for pathogen monitoring in recreational waters (see Attachment G). The goal is to determine the relative safety of surface waters for swimming and water-based recreational activities. Currently the Water Quality Criteria focus on *E. coli* and enterococcus as the indicators of such water quality. Indicators are generally not pathogens; however, they have been demonstrated to correlate with swimming-associated gastroenteritis as fecal coliform which was used in the past for such evaluations. The need is to be able to conduct real-time assessments so that any problems can be addressed by advisories that are relevant to the period during which contamination is detected. Limitations of current indicators require research to resolve. Current needs focus on: types of illness beyond gastrointestinal effects and

beyond currently recognized pathogens, linkages between the indicators now used and actual pathogens, risk assessment for non-human sources of pathogens, and additional epidemiology studies. Needs associated with source identification include comparative evaluations of bacterial source tracking methods, and development of more precise/timely/less expensive source identification methods.

An emerging water quality issue is the occurrence of pharmaceuticals and other organic wastewater compounds in Region 6 waters. Analytical techniques now allow us to pick up these compounds in water. Their occurrence is widespread and results from human and agricultural activities. Region 6 is involved with two studies on this issue. The Northwest/North-Central Arkansas Stream Study is looking at the occurrence of antibiotics and other OWCs in selected streams that receive wastewater treatment plant effluents. Detectable concentrations of at least one antibiotic residual, pharmaceutical, hormone or other OWC was observed in water samples at all sites except one. None of the chemicals exceeded available drinking water guidelines, advisories or aquatic life criteria, but for most of the targeted compounds there are no such standards in place. A study of antibiotics in wastewater in New Mexico also found detectable levels of several compounds.

Research needed to address this issue includes transport and fate of antibiotics and other OWCs in effluent dominated streams; presence of antibiotic resistant bacterial strains in such streams, and the study of ecological effects in such streams.

Another issue discussed by Mr. Schaub was golden algae blooms that cause fish kills in Texas waters. The kills mostly occur in winter and they are increasing. Research needs include distribution of the algae, if and how it is spreading, how to predict blooms, life cycle factors, control, and human/ecological effects.

SAB Members questions and comments included:

- i) How would cheaper and faster monitoring methods change Region 6 practices in recreational water pathogen programs?
- ii) Have Region 6 states fully implemented any pathogen related TMDLs? (No)
- iii) Dr. Dickson stated that he had some studies that show the effects of estrogenic/pharmaceutical compounds. He volunteered to provide them to Region 6. He believes that this is one of the most significant emerging issues.
- e) **Coastal Land Loss in Louisiana:** Mr. Wes McQuiddy, Water Quality Division, Region 6 (see Attachment H). Mr. McQuiddy focused on the uncertainty and implications of physical processes such as faulting on the potential efforts to protect and restore wetlands and barrier islands in coastal Louisiana. Compounding factors in determining how to protect such lands include the influence of oil and gas extraction relative to faulting and subsidence of the lands; possible sea level rise/climate change; and severely reduced sediment loads in the Mississippi River. These factors

have the ability to determine the likely success of the various approaches that might be implemented to restore and/or protect these lands. Questions exist on whether long-distance sediment transport is feasible and cost effective, whether shoreline protection using rocks is effective and if it has its own ecological implications; and whether Mississippi River redistribution would restore deltaic function without having negative water/sediment effects.

SAB Members questions and comments included:

- i) Members asked if the program was considering possible impacts from future sea level rise. The answer was no. The Board noted that NSF has resources for the study of climate related decision making. While these funds are primarily for University-based research, the Board suggested that staff from Region 6 might cooperate with some local university in proposing such work.
- ii) Framing the question as only water quality misses the social and economic dimensions of the issue, for instance, the issues cited by EPA are also relevant to coastal damage and the local economy as a result of hurricanes. Responding to this dimension may be just as important as the water quality/restoration issues.

Mr. McQuiddy also discussed the issue of hypoxia on the inner continental shelf of the Gulf of Mexico off Louisiana and Texas. The issue focuses on low dissolved oxygen in the Gulf during portions of the year. The likely cause is excessive nutrients entering the Gulf. Information is needed on the ecological and economics effects of Gulf hypoxia, how hypoxia affects the shelf ecosystems (finfish, shellfish, benthic populations' productivity and diversity), the effect on commercial/recreational fisheries, and the relative importance of nitrogen and phosphorus as causes of hypoxia – also whether focusing on one or the other of these is more cost effective and the impact of that focus on the overall problem, whether redistribution of Mississippi River water flow could help solve this and the coastal land loss problem without causing water/sediment quality problems.

SAB Members questions and comments included:

- i) Members asked about the nature of the hypoxic zone is (it is about the size of Delaware, changes with the currents and time of year as well as the depth of the water).
- ii) Does EPA have to address the wetlands loss issue regardless of the influence of the confounding factors? (The Agency has discretion to not address loss where data demonstrate that such inaction is appropriate due to the likelihood that management would not work).
- iii) Urban sprawl is another Region 6 emerging issue with huge ecological implications (loss of terrestrial/aquatic ecosystems). (The regions “Smart Growth”

program is relevant to that topic and this is a major initiative of the Regional Administrator).

iv) The Office of Water at EPA Headquarters has a task force on hypoxia. There may be a move to take the issue to the SAB or the NAS.

- f) **Geologic CO₂ Sequestration:** Mr. Phillip Delliinger, Water Quality Division, Region 6 (see Attachment I). Mr. Delliinger discussed the US Global Climate Change initiative. He noted that addressing climate change will require large emission reductions of CO₂ over the next century and that this will require a portfolio of new technologies. Possibilities for sequestration exist in the oceans, on land and in geologic strata. Sequestration is relevant to EPA's missions under SDWA (underground source water protection) and because of EPA's underground injection control mission. Major challenges include research on scale and storage timeframes, risk assessment, liability, long-term monitoring, regulatory uncertainty, and public perceptions.

The oceans could store much more than other areas; however, the impact of doing this is uncertain, there are pH concerns, the limits to accessibility of oceans from inland areas, and ocean dumping laws make this difficult. Terrestrial sequestration could be approached by protecting ecosystems that now store carbon or through manipulating ecosystems to increase sequestration. These are low cost and relatively easy approaches; however, there are land use restrictions, the permanence is uncertain and quantification and monitoring are difficult. Geologic injection into active oilfields, into coal bed methane reservoirs, or injection into a saline aquifer, are possibilities. There are proven technologies for this, the potential capacity is large, and they might generate revenues from enhanced oil/gas recovery. However, concerns exist over possible leak points (abandoned well bores), corrosion at well sites, uncertainty about fate and behavior once injected, there are limits to geologically acceptable areas, and there are long term monitoring concerns. Geologic sequestration could contribute much to mitigation of CO₂ levels. Mr. Delliinger mentioned a number of research projects underway on this, much of which is funded by the Department of Energy.

SAB Members questions and comments included:

- i) Has the agency conducted any public perception work on this issue? Public perception issues can increase the time needed to get programs like this implemented. A recent ES&T article by Palmgren, et al., might be of interest to the Region on in this regard. (The Region's public perception work has focused on hazardous waste injection in general not just CO₂.) (Full citation: Palmgren, C.R., M. G. Morgan, W. B. de Bruin, and D. W. Keith. 2004. "Initial Public Perceptions of Deep Geological and Oceanic Disposal of Carbon Dioxide." *Envir. Sci. & Technol.* 38(24):6441-6450.
- ii) The agency is to be complemented on moving forward with this issue and holding the several workshops that it has held on it. The Board urged EPA staff to consider

the adequacy of Class I regulations for regulating the sequestration of CO₂. In particular, given the very large volumes that would be involved, greater attention to pre-injection site characterization may be required, a more adaptive approach may be needed since it may be difficult or impossible to accurately predict where the fluid will go, and much more extensive post-injection monitoring may be required both for safety and for assurance that the CO₂ injected can be traded in a possible future cap and trade regime.

The meeting was adjourned for lunch at 12:00 pm

The meeting was reconvened at 1:30 pm. Dr. Grasso, SAB Vice Chair, assumed the Chair for the afternoon due to Dr. Morgan's medical emergency.

g) Preview of Issues Concerning GISSST: Dr. Sharon Osowski, California and Enforcement Division, Region 6 (see Attachment J). Dr. Osowski discussed the GIS Screening Tool for environmental assessments that Region 6 is developing. The tool uses GIS coverage and databases and imposes a scoring structure on the available data for included criteria. It is not intended to replace field studies. The tool works with geographic units which are divided into 1 square kilometers grids within which important environmental features are characterized and assigned a GISST score. Criteria used include ecological, socioeconomic, toxicity, landscape, water quality, air quality, and pollution prevention. This tool will be reviewed by an SAB review panel later in calendar year 2005. Primary questions will be whether the intended uses by the Regional Office are appropriate, if the method is appropriate, and the identification of enhancements needed.

SAB Members questions and comments included:

- i) Are the criteria weighted? (No)
 - ii) Irrespective of the scoring, the method seems to bring relevant environmental information to the decision maker to view. This is an improvement over what is now done.
 - iii) This again looks like the CrEAM which seems to be a regression model looking for a dependent variable. This could be a problem for this tool as well.
 - iv) There seems to be a proliferation of tools across the regions to do things that are important to their activities. This is quite creative. Is it possible to do a national level tool to use in planning across all locations?
 - v) The CVPESS will ultimately provide information that could be of value to the regions in looking at these issues.
- h) Geochemistry and Physics of Site Cleanup at a Challenging Superfund Site: Tar Creek, OK:** Mr. Sing Chia, Superfund Division, Region 6 (see Attachment K1 and

K2). Mr. Chia discussed the pilot project to determine the feasibility and cost associated with placement of chat (mine waste) into mine workings at the Tar Creek site. Several placement methods were studied; gravity placement, auger assisted placement, and water assisted placement. The techniques were studied at two sites. Water assisted placement was the most successful at both sites. Additional pilot studies are now underway.

SAB Members questions and comments included:

- i) Did particles aerosolized during the study? (None were detected in air monitoring).
- i) **Region 6 Interest in Remote Sensing:** Mr. Barry Feldman, Multimedia Division, Region 6 (see Attachment L). Remote sensing addresses current facility inspection and environmental monitoring needs in Region 6. Remote sensing can identify likely non-conforming facilities for follow up inspection. Advances in hyper-spectral collection yield more data at higher resolutions than past low resolution techniques. Remote sensing challenges include that it is difficult to apply, there is a need for cooperation and collaboration to obtain adequate funding to support RS , and resources are needed for developing more RS tools and for collecting data. Mr. Feldman briefly discussed a number of Region 6 hyper-spectral imaging projects including: PlumeEx (multiple airborne sensors are flown along a transect of interest – this involves several organizations - EPA, TCEQ, County, the US Air Force, and Dow Chemical Co. – focused on fugitive emissions at a Dow facility); Houston Ship Channel Monitoring (sensors found very high emission levels over the channel); and Smart LDAR (laser detection of fugitive emissions early enough to correct them prior to their accumulating to significant levels). The Regional office will continue to analyze data collected in these studies and work to develop new sensors for application to their problems.

SAB Members questions and comments included:

- i) Has Region 6 initiated work to alleviate the Houston Ship Channel situation? (Houston is a non-attainment area and activities focused on attainment are helping to lessen the problem.)
- ii) Is agricultural burning a problem in Region 6? (Ag burning is a problem, but its control is not with EPA.)
- iii) Will the Region be obtaining a HAWK camera? (The Region would like to and may be able to as prices come down over time).
- j) **Setting Priorities by Linking Model Results to Health Effects:** Mr. Jeff Yurk, Multimedia division (RCRA), Region 6 (see Attachment M). Region 6 has some 100 million pounds of air toxics releases annually from over 200,000 point sources. People wonder if the air they breathe is safe. Linking air toxics information with human health issues is needed. To do this, Region 6, with its limited resources, identifies issues and then looks to other Regional media programs and other agencies

outside EPA to obtain multiple perspectives and assistance on evaluating the issue. In the example presented, butadiene, the Region proposed an approach they are interested in implementing that would do a screen of available information to determine if a cancer cluster might exist and then to follow up with additional study to better characterize whether the cluster was real. The actual epidemiologic study would be conducted in partnership with CDC in an attempt to determine if a population is suffering adverse effects from specific exposures. They asked the SAB if their targeting method was appropriate.

SAB Members questions and comments included:

- i) A number of issues were suggested that would make the study incomplete if the situations were not addressed (e.g., age, SES, whether there is a differential risk of elevated disease, income generating activities, disease states, access to medical resources, time lags from exposure to effect, etc.).
- ii) Does the Texas Health Department has its own epidemiology unit. (The Region is working with the Texas Cancer Registry).
- iii) Cancer cluster investigations have many issues – an important concern of people is to know the current cancer risk and not just the past risk. You need community involvement early on to ensure they will be willing to do the things needed to do the study.
- iv) There is a huge literature on cancer cluster investigations and the Region should consider getting cluster specialist from Texas on the team to help on the study. Your data already shows some interesting things from just the rough table you presented. The Texas Cancer Registry is a good organization.

3. General Discussion of Regional Science Issues: The Board members discussed ways that the SAB might assist the Regional Office. Is there something we might highlight for the Administrator about Regional Office science needs? Suggestions from members included the following:

- a) We might suggest a Region-focused pilot project in ORD similar to proposed for the program offices for FY 20067. Additional interactions beyond those already practiced among the Regional Offices and ORD might be helpful.
- b) Regional Offices might act as a catalyst for science efforts carried out by universities or even localities to identify emerging issues. Establishing such a network could facilitate the development of workshops and other collaborative efforts.
- c) Regional Offices are working to develop their own individual tools to look at ecosystem issues (e.g., GISST, CrEAM). The SAB could do a review of Regional tools and give them insight on how to approach specific problems. Alternatively,

ORD could serve as a clearinghouse for Regional tool development (EPA and other agencies). They could identify themes for cross-region/headquarters use among those being developed and how they might be improved. There seems to be a clear need for additional Regional Office support in the budget and the Board might need to develop a letter to the Administrator or Regional Administrators with information on how the Board might be able to assist with their needs.

- d) The Board might think of Regional support issues in light of the budget for those activities. For example with tight budgets regions are working from their narrower geographic/issues perspective to develop tools that they need. Small increases could help in this regard (e.g., increased travel budgets that permit staff scientists to reach out to scientists elsewhere, to participate in workshops that share information and approaches across regions). For issues requiring larger fixes, e.g., hypoxic zone in the Gulf of Mexico, larger funding infusions should be made available at EPA, and through cooperative ventures with other agencies like NOAA.
- e) EPA Headquarters recognition of Regional Offices as clients seems to need improvement so that Regional science needs can have more influence on planning and budgeting. SAB could be a booster for regional science needs to bring improved visibility to the issue. The Board needs to determine how large a role they want to play in regard to regional science needs and then to develop a way to enhance that role if that is the decision.
- f) Is there a need for region-specific advisory boards?

The meeting was adjourned for the day at 5:20 p.m.

Thursday, May 12, 2005

Dr. Genevieve Matanoski Chaired the Board meeting for Thursday, May 12, 2005 because of Dr. Morgan's medical emergency.

- 4. Review and Approval of SAB Draft Reports:** Dr. Matanoski introduced the topic and noted that the primary purpose of the Board's review was to determine whether:
- a) the original charge questions to the SAB Panel were adequately addressed;
 - b) the draft report is clear and logical; and
 - c) the conclusions drawn, and/or recommendations made, are supported by information in the body of the draft SAB report.

The Board is also asked to identify errors, or omissions, that they note during their review of draft reports. However, the Board is not responsible for identifying all possible errors and omissions that might be contained in a draft report. It is reasonable for Board members to highlight and seek resolution of any issues that are caused by technical errors or omissions that they do notice during their review.

a) Review of the SAB Draft Report *SAB Review of the EPA Region 5 Critical Ecosystem Assessment Model (CrEAM)*.

Dr. Virginia Dale noted that the purpose of CrEAM is to identify ecologically important areas see attachment N. CrEAM was considered by the Panel to be useful as a screening tool, but that it was not a model that could be used for actual decision making (e.g., permitting). She noted some terminology problems as well. Dr. Dale stated that Dr. Morgan had provided her with comments earlier that she would use to make revisions to the document (i.e., the impact of evenly weighting data layers; that using the term ecologically significant in the report might be misinterpreted; and the figure on page 9 of the report – which will be removed).

Dr. Twiss (participating by telephone) believed that the Panel report was very well done and that the Quality Review Committee (see Attachment O) had had few comments on the draft. Dr. Dickson noted that the QRC thought that the Panel had done an excellent job and that their critique was constructive but also provided useful criticism. The panel draft was approved by the QRC for consideration by the full SAB consideration.

It was moved and seconded that the report be approved.

Members discussed the draft report noting the following:

a) A recurring concern is that many such efforts are treated as regression models that are often considered to be capable of generating statistically significant results that can be used to base decisions upon. It appears to be a "regression in search of a dependent variable" and attempts to reduce many characteristics on any specific land unit to a single index that measures the extent to which it should receive concern. In an ideal situation, we would have the model tested in the field by ecologists doing data gathering and that information would be integrated into the model. However this is not practical to do. Attachment P was provided as an explanation of these concerns and what might ultimately be done.

b) The report should note these concerns and boundaries; however, there is a need for such tools in the regions and the issue is for a screening model, how much uncertainty is acceptable.

c) The work is excellent and that it serves a need. Clearly, selection of weights determines the outcome of the model. It is a good tool to use to see how things change when different things are weighted differently. It can help to show what various participants value.

d) The model, though having limitations, is better than just looking at a map and it represents a great step forward for such applications.

e) CrEAM provides a tool for looking at data layers. Not a tool to get the ultimate answer, but it is a way to look at things when you weight them in various ways.

f) CrEAM is similar to the Superfund rating system in that it provides multiple data that practically defaults to a simple yes/no system. CrEAM qualitatively identifies geographic units that one should be concerned about and for which additional consideration is needed prior to a decision to take some action on that unit. It further allows such consideration to be given at the beginning rather than late in the decision process on such activities. Tools like this, which support Regional Office consideration of issues associated with geographic units, are the wave of the future.

g) To do more in the way of improving the model now might be asking more of ecology than it can yet provide. To be too constraining on this model would be out of step with the position taken by the Board when it considered an earlier modeling activity (3MRA) and that we should try for consistent treatment of these types of efforts.

h) To go too far down the path of refining the model at this point might also be counter to the reality of the model's limitations. That is, if some improvements to the model's precision are made, users might have more confidence in its accuracy than is deserved.

i) The draft report does have language warning of the limitations to its use. The model developers need to ensure that they consider the agency's regulatory evaluation model (REM) guidance (and to note they have done so). This will itself help to "caveat" the use of CrEAM.

j) There is a need to pretest the model to see how it plays out relative to community values and concerns.

The report was approved by the Board noting that a number of editorial changes should be made, including:

- a) strengthening the paragraph on limitations to the use of CrEAM in decision making;
- b) noting that the model should be in conformance to EPA's REM guidance;
- c) suggesting a pretest relative to community concerns;
- d) and noting the importance of continued initiatives in Regional Offices to develop tools that help them evaluate issues that they must consider action upon.

The report is approved for transmittal to the Administrator subject to these edits and obtaining the reactions of the following Board vettors to those revisions (Drs. Twiss, Dickson, Theis, Kling, Cameron, Young, and Swackhamer).

b) Review of the SAB Draft Report *Science and Research Budgets for the U.S. EPA for FY 2006*

Dr. Matanoski introduced the discussion of the draft report of the Board on EPA's science and research budget for FY 2006. She noted that she wished the Board to: 1) consider the format for the letter and whether a shorter letter with an attached set of "key points" was acceptable; 2) discuss revisions needed in the body of the report; and 3) discuss revisions needed to the letter to the Administrator (see Attachment Q1 and Q2).

i) Format of the Report: The letter was initially drafted in a long version and then shortened to "punch lines." An attachment now elaborates on the "punch lines" in the letter. Members agreed that this format was appropriate for the report.

ii) Body of the Report: Members noted the need for a number of changes. These included:

aa) Section 2.1: Add a stand alone statement at the beginning on special concerns with the need for ecological, social science and general extramural funding and note concern with morale in the science units with continuing budget erosion in ORD. Also add the need for ecological research to the letter.

bb) Section 2.1(starting on page 4): Reorganize the "Aspects of STAR" section for clarity. One approach would to change that now there to a) Balanced Research Program; b) Need for Ecological Research; and c) Aspects of STAR.

cc) Refer to the positive review of STAR by NAS in body of report and summary.

dd) Questions were raised on the risk communication statement on page 8, starting at line 23. Members agreed that it was intended to suggest, in strong terms, that EPA is losing its leadership in this area of research.

dd) Page 8 lines 39-41: Members noted the strikeout there and directed that the original text remain.

ff) Page 14, lines 29-31: Members suggested that the sentence begin with "Most" and delete "With just a few isolated exceptions." Also, replace "There has not been sufficient" with "There should be more."

gg) Page 16 ???Comment on Greenhouse gases???

hh) Page 28, line 8: Delete "...and prevents inbred or stale research from taking hold;"

ii) Page 28, line 13 forward: Note the 2004 NAS review of STAR and its positive statements in regard to that program.

kk) Page 32, line 17 forward: Comment by Dickson on what citizens can do themselves????

ll) Page 33, line 1 and lines 5-7: “The Board” instead of “Goal 5 Team.” Delete”In designing both.....through research on innovations?”

mm) Page 34: Add “Compliance” section as drafted and commented upon during the meeting.

“c) Compliance: Environmental compliance activities are another area in which EPA’s scientific research does not align effectively with its priorities. One of EPA’s strategic objectives is to “...strengthen the scientific evidence and research supporting environmental...decisions on compliance, pollution prevention, and environmental stewardship.” Further, EPA’s subobjective 5.1.3 calls for a 5% increase in “enforcement actions.” This subobjective is undercut by deficiencies in research funding for enforcement.

Overall, Science and Technology (S&T) funds for research are low and the increased needs for homeland security have resulted in shifting of some NEIC assets within this key, specialized investigative unit of EPA, to homeland security issues. While some of NEIC’s science in this area may be useful for non-homeland security issues, the Board is concerned that this change might significantly restrict EPA’s ability to continue to prosecute the most significant violations of EPA regulations and enforce them using evidence derived from scientifically credible methods.

nn) Approach OECA personnel for the next science and research review to get a richer background on the full compliance program and how science, NEIC and other, are used to support those efforts.

iii) Letter to the Administrator: The letter to the Administrator will be short making key points in two blocks, one will be on positive findings and the other will be on concerns of the Board. There will be an attachment of “Key Points” that will elaborate on the bullets.

aa) A bullet will be added on the need for ecosystems research in general, not just as a comment associated with STAR.

bb) A bullet will be added on the need for Climate Change research to respond to EPA mission components that are affected by climate changes. Dr. Kasperson will provide language for this statement.

cc) Dr. Matanoski will provide revised language on homeland security (bullet “g” in the draft letter to the Administrator) additions and their impact to research already within EPA’s portfolio.

dd) The introduction to paragraph 2 of the letter “Balance of funding” talks of a dichotomy (research vs. science) that is not recognized by the scientific community. The sentence will be deleted and a new introductory sentence added.

Dr. Matanoski then asked members for a vote on accepting the body of the report with the proviso that changes noted will be made to the current draft. Members agreed to accept the body with that condition.

Dr. Matanoski noted that we would make the revisions to the letter to the Administrator and circulate it to members for quick review. The report will then be sent forward after the letter finishes review and is revised as appropriate.

Dr. Matanoski adjourned the meeting at 10:00 a.m.

Respectfully Submitted:

Certified as True:

/ S /

/ S /

Thomas O. Miller
Designated Federal Officer

Dr. Granger Morgan
Chair, EPA Science Advisory Board

/ S /

Dr. Domenico Grasso
Vice Chair, EPA Science Advisory Board

/ S /

Dr. Genevieve Matanoski
Acting Chair, EPA Science Advisory Board

ATTACHMENTS

Attachment A:	Roster of the Executive Committee
Attachment B:	Meeting Agenda
Attachment C:	Federal Register Notice
Attachment D:	Sign In Sheets
Attachment E:	Presentation slides – Mr. Knudson
Attachment F1:	Presentation slides – Mr. Callahan
Attachment F2:	How Science is Used in Decision Making in Region 6
Attachment G:	Presentation slides – Mr. Schaub
Attachment H:	Presentation slides – Mr. McQuiddy
Attachment I:	Presentation slides – Mr. Dellinger
Attachment J:	Presentation slides – Dr. Osowski
Attachment K1:	Tar Creek Chat Placement Pilot Presentation Slides – Mr. Chia
Attachment K2:	Chat Placement Pilot Project Status – Mr. Chia
Attachment L:	Presentation slides – Mr. Feldman
Attachment M:	Presentation slides – Mr. Yurk
Attachment N:	Draft CrEAM Report
Attachment O:	Minutes from the CrEAM QRC Meeting of 4/4/2005
Attachment P:	Dr. Cameron’s input on CrEAM-Regression in search of a dependant variable, 4/25/2005
Attachment Q1:	Draft Science and Budget Report -5/3/2005
Attachment Q2:	Draft Letter to Administrator – new format – 5/3/2005