



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

June 22, 2004

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

MEMORANDUM

SUBJECT: U.S. EPA Science Advisory Board (SAB) Critical Ecosystem Assessment Model (CrEAM) Review Panel

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This memorandum addresses the set of determinations that were necessary for forming a Science Advisory Board Panel. It provides background information on the subject SAB activity and addresses:

- 1) the charge developed for the Panel;
- 2) the type of panel that will be used to conduct the review, the name of the Panel, and identification of the Panel Chair;
- 3) the types of expertise needed to address the charge;
- 4) Conflict of Interest Considerations (whether the charge involves a Particular Matter and how conflict of interest regulations under 18 U.S.C. 208 apply to members of the Panel);
- 5) how regulations concerning "appearance of lack of impartiality, under 5 C.F.R. 2635.502 apply to members of the Panel;
- 6) how individuals were placed on the "Short List" posted on the SAB website as candidates for the Panel; and
- 7) how individuals were placed on the Panel.

A. Background

EPA Region 5 has requested that the SAB conduct a review of the Critical Ecosystems Assessment Model (CrEAM). The CrEAM is a spatially explicit model developed by Region 5 for predicting the ecological significance of undeveloped land using ecological theory, existing data sets, and geographic information system (GIS) technology. The EPA Region 5 Critical Ecosystems Team developed the CrEAM to assess the ecological significance of land areas across the states of EPA Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). The model may potentially be used to identify significant ecosystems in order to target protection and restoration efforts in EPA Region 5.

The CrEAM identifies ecologically significant areas by integrating three important conditions: 1) ecosystem diversity, 2) ecological self sustainability, and 3) species and land cover rarity. A geographic information system was selected as the analysis platform for the CrEAM in order to aggregate multiple geographically referenced data sets and conduct landscape scale analysis. The National Land Cover Database (NLCD) was used as the base layer in the model and twenty relevant data sets were used as indicators to predict the potential for ecosystem diversity, ecological self sustainability, and species and land cover rarity at a scale of 300m x 300m.

B. Determinations

- 1) The charge to the Panel: The SAB Staff Office, EPA Region V, and the Chair of the Panel negotiated the following charge.

The Region 5 Critical Ecosystems Team of the United States Environmental Protection Agency (EPA) has created a spatially explicit model to predict the ecological significance of undeveloped land using ecological theory, existing data sets, and geographic information system (GIS) technology. The model has been used to predict locations of ecosystems of high ecological significance in the Region. Twenty data sets were developed from existing data, entered into the GIS, and converted into 20 spatially explicit GIS layers with associated attributes. The 20 data sets were used as indicators for three criteria which taken together are proposed to define ecological significance. These three criteria are potentials for: 1) ecological diversity, 2) self sustainability, and 3) biological and land cover rarity. Of the 20 data sets, four were used to indicate diversity, twelve were used to indicate sustainability, and another four were used to indicate biological and land cover rarity. The indicators for each criterion were combined by summing the associated values at a scale of 300m x 300m, thereby generating three composite GIS data layers that predict spatially explicit ratings for the three criteria and for all undeveloped areas across EPA Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). Each 300m x 300m cell thus has three ratings, one for each criterion. The three sets of criterion ratings are statistically independent, thus the three composite criteria layers can be used individually or in combination depending on the requirements of an application. An application may require summary information solely about diversity, sustainability, or rarity. Alternatively, an application may require a combination of either two or all three sets of criteria

ratings, in which case ratings would be summed for each 300m x 300m cell.

EPA is seeking comment on the scientific validity of the conceptual framework and methodology used to identify ecologically significant ecosystems, and on the scientific defensibility of the results generated from CrEAM queries. Specifically, EPA is seeking advice regarding the following questions.

Question 1. Conceptual Framework:

- 1.1 Is EPA use of the term “ecological significance” appropriate as EPA has defined it? Is there a better term for what is being rated?
- 1.2 Is it scientifically defensible to use these data sets as indicators of the three ecological criteria (diversity, sustainability and rarity) and to generate ratings of the criteria by compositing these indicators?
- 1.3 Is the nesting and compositing of multiple indicator data sets a scientifically valid framework to rate ecosystems?

Question 2. Methodology:

- 2.1 Are the three criteria sufficient and reasonable for rating ecological significance as defined?
- 2.2 Are the indicator data sets sufficient and reasonable for rating the ecological diversity, self sustainability, and biological and land cover rarity, as defined?
- 2.3 Are there any relevant data sets consistently collected across the 6-state Region that should have been used but were not? If one or more such data sets exist, is the value they add to the CrEAM likely to exceed the cost of adding them to the model?

Question 3. Application of the CrEAM to Environmental Decision-Making:

- 3.1 Please comment on the scientific defensibility of the use of CrEAM results to support broad based strategic planning and priority setting activities (e.g., identifying locations for geographic initiatives and EPA/State joint efforts) and program activities such as:
 - Inspection
 - Permitting
 - Enforcement and cleanup
 - Reviewing grant proposals
 - Establishing reference context for ecological protection and restoration

2) Type of panel that will be used to conduct the review, the name of the panel, and identification of the panel chair, and types of expertise needed to address the charge:

The advisory will be conducted by augmenting the expertise available on the EPA SAB’s Ecological Processes and Effects Committee (EPEC) to form an EPA SAB Review Panel. The Panel is entitled, Critical Ecosystem Assessment Model Review Panel. Review of the

CrEAM requires a panel with broad expertise in geographic information system modeling, ecological theory, and the use of indicators to predict the potential for ecosystem diversity, ecological self sustainability, and species and land over rarity. EPEC members provide the required expertise in ecological theory, and this expertise is being augmented to address additional aspects of the charge questions. An FR notice was published on April 21, 2004 (widecast) requesting nominations to augment the expertise available on EPEC from which a “short list” was selected and posted on the SAB website on May 18, 2004 (Attachments 1, 2; http://www.epa.gov/sab/panels/epec_crmpesls.html). The FR notice indicated the expertise needed to augment the EPEC: *ecology and the use of geographic information system technology to evaluate data and conduct landscape scale analyses.*

- 3) Identification of parties who are potentially interested in or may be affected by the topic to be reviewed: The CrEAM will potentially be used by EPA Region 5 to identify and target geographic areas for further assessment, financial assistance, and regulation. Interested and affected parties will be: 1) those involved with the interests of industries and governments in EPA Region V that may be subject to geographically targeted regulation, 2) organizations in EPA Region V that may potentially receive geographically targeted financial assistance. Some non-governmental organizations that focus on environmental policy development will be interested. Academic researchers involved with landscape ecology and geographic information systems, and their application to regulatory assessment techniques, will also be interested in this topic.
- 4) Conflict of Interest Considerations: For Financial Conflict of Interest (COI) issues, the basic 18 U.S.C. 208 provision states that: “An employee is prohibited from participating *personally and substantially* in an official capacity in any *particular matter* in which he, to his knowledge, or any person whose interests are imputed to him under this statute has a *financial interest*, if the particular matter will have a direct and predictable effect on that interest [emphasis added].” For a conflict of interest to be present, all elements in the above provision must be present. If an element is missing the issue does not involve a formal conflict of interest; however, the general provisions in the appearance of impartiality guidelines must still apply and need to be considered.
 - a) Does the charge involve a Specific Party Particular Matter? A “particular matter” refers to matters that “...will involve deliberation, decision, or action that is focused upon the interests of specific people, or a discrete and identifiable class of people.” It does not refer to “...consideration or adoption of broad policy options directed to the interests of a large and diverse group of people.” [5 C.F.R. 2640.103 (a)(1)]

The SAB Panel’s activity in addressing the CrEAM charge qualifies as a particular matter of general applicability because the resulting advice will be part of a deliberation, and under certain circumstances the advice could involve the interests of a discrete and identifiable class of people but does not involve specific parties. That group of people is the set of people that are involved with: 1) public or private organizations subject to geographically targeted regulation in EPA Region V, and 2)

organizations that potentially receive geographically targeted grants in EPA Region V related to the CrEAM. The Special Government Employees (SGEs) who are to serve in this SAB review are part of a group of people who could represent organizations that in the future might be regulated by EPA Region V or seek funding for projects in ecologically significant areas identified by the CrEAM. *Thus, the matter does involve deliberation that focuses upon the interests of a distinct and identifiable group of people, that is, the community that may be subject to regulations in EPA Region V or receive geographically targeted grants from EPA Region V related to the CrEAM.*

- b) Personal and Substantial Participation: Participating personally means participating directly. Participating substantially refers to involvement that is of significance to the matter. [5C.F.R. 2640.103(a)(2)]. For this review, SAB Staff determined that panel members will be participating personally in the matter. SAB reviewers will provide advice that might influence the priority given to specific ecologically significant areas in Region V. The advice could divert emphasis, and therefore potential regulatory activity or funding, from one geographic area to another. *Therefore, participation in this review will also be substantial.*
- c) Direct and Predictable Effect on Members Financial Interest: A direct effect on a participant's financial interest exists if, "... a close causal link exists between any decision or action to be taken in the matter and any expected effect of the matter on the financial interest...A particular matter does not have a direct effect...if the chain of causation is attenuated or is contingent upon the occurrence of events that are speculative or that are independent of, and unrelated to, the matter. A particular matter that has an effect on a financial interest only as a consequence of its effects on the general economy is not considered to have a direct effect." [5 C.F.R. 2640.103(a)(i)] A predictable effect exists if, "...there is an actual, as opposed to a speculative, possibility that the matter will affect the financial interest." [5 C.F.R. 2640.103(a)(ii)]

Each EPEC member, and candidates who were considered to supplement the EPEC in this review, could now have financial links to organizations in EPA Region V that may, in the future, be regulated or receive grants on the basis of CrEAM analysis. This could be in the form of existing or pending grants, cooperative agreements, or contracts. Further, these persons could submit proposals for such grants, cooperative agreements, or contracts in the future.

In determining whether a member's or candidates's participation has a direct and predictable effect on their financial interest, staff has evaluated the process for awarding grants and whether it could directly tie a person's actions in this review to financial gain. In evaluating this factor, the requirement is that a person's actions in participating in the matter must have a "close causal link" to their financial interest. Further, the link must be predictable, that is actual and not "speculative". In the case of members of the CrEAM Review Panel, the "chain of causation" is attenuated and contingent upon the occurrence of events that are speculative. That is, the CrEAM may identify

ecologically significant areas in Region V that could be targeted for regulation or financial assistance, but the model will not address specific projects that could be funded, or organizations that might be regulated by EPA Region V. Further, selection of grant recipients follows a complex two-stage process in which independent reviewers judge the scientific quality of a proposal and then Agency representatives judge the relevance of the proposal to answering major scientific questions within the subject area. Thus, actual selection of grant recipients is mediated by a chain of events that attenuates any direct linking of a grant to a panel member's participation in the review of the CrEAM. Any effects from participating in this review would not be direct, nor would they be predictable. Therefore, no conflict of interest as defined by 18 U.S.C. 208 exists in association with grant holding by members of the Critical Ecosystem Assessment Model Review Panel.

Because the procedure for awarding cooperative agreements and contracts differ, each specific situation has been evaluated to determine if a direct and predictable effect exists between the person's participation and their financial interest.

In addition, matters in which panelists have grants, cooperative agreements, and contracts from EPA that are for work that fits conceptually or specifically within this ROE, have been evaluated under the requirements for considering "appearance of impartiality" under 5 C.F.R. 2635.502 which is discussed below.

As a result of a review of the EPA Form 3110-48 provided by each prospective CrEAM Panel member, the SAB Ethics and FACA Policy Officer, in consultation with the Alternate Agency Ethics Official, has determined that there is no financial conflict-of-interest presented for the selectees for the CrEAM Panel. In addition, the CrEAM Panel's advice on the particular matter under review will not have a direct effect on the financial interest of the CrEAM Panel members.

- 5) How will regulations concerning "appearance of lack of impartiality" under 5 C.F.R. 2635.502 and other ethics factors, apply to members of the Panel: The Code of Federal Regulations [5 C.F.R. 2635.502(a) states that: "Where an employee knows that a particular matter involving specific parties is likely to have a direct and predictable effect on the financial interest of a member of his household, or knows that a person with whom he has a covered relationship is or represents a party to such matter, and where the person determines that the circumstances would cause a reasonable party to such matter, and where the person determines that the circumstances would cause a reasonable person with knowledge of the relevant facts to question his impartiality in the matter, the employee should not participate in the matter unless he has informed the agency designee of the appearance problem and received authorization from the agency designee." Further, 5 C.F.R. 2635.502(a)(2) states that, "An employee who is concerned that circumstances other than those specifically described in this section would raise a question regarding his impartiality should use the process described in this section to determine whether he should or should not participate in a particular matter."

As noted above, the CrEAM can be considered as a particular matter of general applicability involving a discrete and identifiable class in some circumstances (i.e., for members and candidates involved with: 1) public or private organizations subject to geographically targeted regulation in EPA Region V, and 2) organizations that potentially receive geographically targeted grants in EPA Region V. However, as also noted above, the chain of events for a grant is attenuated by certain factors that do not constitute a conflict of interest and the “appearance of impartiality” criterion at 5 C.F.R. 2635.502(a) is not met. Cooperative agreements and contracts may present a different situation, and each Panel member was evaluated to determine whether his financial interest in existing cooperative agreements and contracts constitutes an “appearance of impartiality”.

Even though circumstances for some specific candidates for the Panel may not raise formal COI, nor formal appearance concerns, each candidate was evaluated against the five C.F.R. 2635(a)(2) general requirements to ensure that appearance of impartiality issues do not preclude their participation. Information used in this evaluation has come from Panel members’ EPA 3110-48 forms and other staff research. For Panel members who hold grants, cooperative agreements or contracts or are involved with organizations subject to regulation in EPA Region V, Staff have determined whether the “reasonable person” criterion is met in the following manner:

- i) Those who are employed by the regulated community in EPA Region V were considered to meet this criterion.
- ii) Those who have a pending grant, cooperative agreement, or contract whose funds could be directly received from EPA Region V as part of a member’s or candidate’s salary for efforts to research, restore, or protect ecologically significant areas in EPA Region V were considered to meet the criterion.

To further ascertain whether there was any potentially disqualifying involvement with the topic of the CrEAM advisory, which would indicate the appearance of a lack of impartiality, the following five (5) questions were posed to all candidates for the CrEAM review:

- a) Do you know of any reason that you might be unable to provide impartial advice on the matter to come before the Panel or any reason that your impartiality in the matter might be questioned?
- b) Have you had any previous involvement with the issue(s) or document(s) under consideration, including authorship, collaboration with the authors, or previous peer review functions? If so, please identify those activities.
- c) Have you served on previous advisory panels or committees that have addressed the topic under consideration/ If so, please identify those activities.

d) Have you made any public statements (written or oral) on the issue? If so, please identify those statements.

e) Have you made any public statements that would indicate to an observer that you have taken a position on the issue under consideration? If so, please identify those statements.

As a result of a review of the EPA Form 3110-48 and the responses to the above (5) questions provided by each prospective CrEAM Panel member, the CrEAM DFO and SAB Ethics and FACA Policy Officer, in consultation with the Alternate Agency Ethics Official, have determined that there is no appearance of a lack of impartiality on the part of the selectees for the CrEAM Panel. One individual serving on this panel has received EPA grants for the development of environmental indicators. However, the CrEAM review is not expected to have an effect on work in this area.

- 6) How individuals were placed on the short list: Eleven (11) individuals were nominated to augment the expertise of the EPEC on the CrEAM Review Panel. On the basis of the candidates' qualifications and availability to participate in the review meeting, the SAB Staff Office made the decision to put eight nominees on the "short list". On May 18, 2004, the SAB Staff Office posted a notice on the SAB Web site inviting public comments on the "short list" of eight prospective candidates to augment the expertise of the EPEC on the Panel. That notice stated that SAB staff reviewed the nominations for the Panel and identified a "short list" of eight based on qualifications, interest, and availability of the nominees.

The SAB Staff Office requested public comments on the list of the CrEAM Panel candidates. In particular, the notice on the Web site stated that the Staff Office would welcome any information, analysis or documentation that the SAB Staff Office should consider in evaluating the candidates on the "Short List", and asked that any advice, observations or comments which would be helpful in selecting the final candidates be provided to the SAB Staff Office no later than June 9, 2004. *The SAB Staff Office received no comments on any "short list" candidate for the cream Panel.*

- 7) How individuals were selected for the final Panel: The SAB Staff Office Director - in consultation with the CrEAM Panel Chair - makes the final decision about who serves on the Review Panel during the "Panel Selection" phase. The final Panel was selected by augmenting the expertise available on the EPEC with nominees from the "short list". Selection criteria included: scientific and technical credentials and expertise; the need to maintain a balance with respect to members' qualifying expertise background and perspectives; willingness to serve on the Panel, and availability to meet during the proposed time period; and a candidate's prior involvement with the topic under consideration. Selectees for the CrEAM Review Panel have backgrounds that include experience with academia, states, industry, and consultant groups.

Accordingly, based on the above specified criteria a Cream Review Panel of the following fifteen experts was selected:

1. Dr. Virginia Dale, Oak Ridge National Laboratories (TN) (Chair)
2. Mr. DeWitt Braud, Louisiana State University (LA)
3. Dr. Peter Curtis, Ohio State University (OH)
4. Dr. Ivan Fernandez, University of Maine (ME)
5. Dr. Judith Meyer, University of Georgia (GA)
6. Dr. Thomas Mueller, University of Tennessee (TN)
7. Dr. Michael Newman, College of William and Mary (VA)
8. Dr. Charles Pittinger, Exponent (OH)
9. Dr. Amanda Rodewald, Ohio State University (OH)
10. Dr. James Sanders, Skidaway Institute of Oceanography (GA)
11. Mr. Timothy Thompson, RETEC Group (WA)
12. Ms. Sandra Williams, Blueskies Environmental Associates (VA)

Concurred,

/Signed/

June 22, 2004

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Date