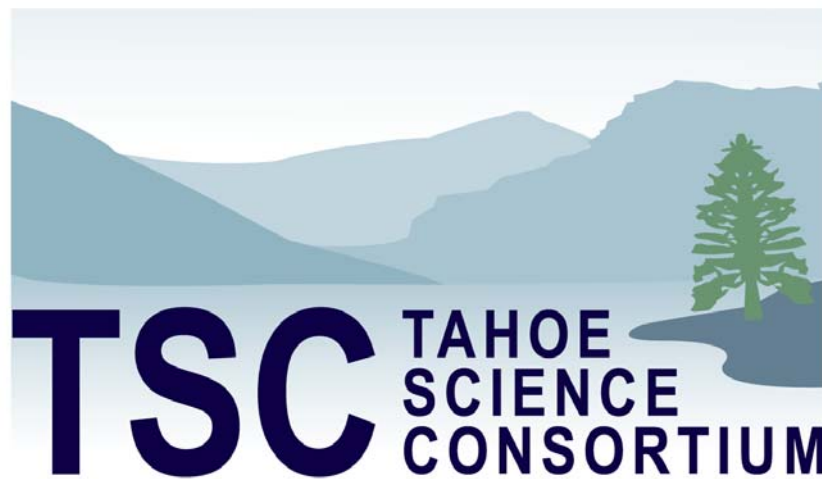


*Functions, Organizational Structure,  
Responsibilities, and Operating  
Guidelines for the Tahoe Science  
Consortium*



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January 5, 2007

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## I. Introduction

The Tahoe Science Consortium (TSC) was formed in August 2005 through a memorandum of understanding (MOU) among research institutions and resource management agencies actively involved in the restoration and management of the Lake Tahoe Basin. The vision for a TSC and the underlying MOU grew out of extensive deliberations among science community and resource management agency representatives. These deliberations led to a consensus document,<sup>1</sup> which describes the purpose and conceptual organization of the TSC. Through the MOU, a consortium of research institutions has pledged to work cooperatively with the resource management agencies to establish and sustain collaborative science efforts that will provide information essential to determining the most efficient path to restoring and maintaining Lake Tahoe's complex ecosystems.

Formation of the TSC was preceded by establishment of the Tahoe Science Advisory Group (TSAG). Members of the TSAG agreed to cooperate in developing a consistent vision for science and research as it applies to restoration of the Lake Tahoe Basin. While the TSAG met regularly and commented on individual efforts in the basin, it had neither the charge nor the resources to develop a vision, structure, and program capable of supporting the science activities needed to inform Lake Tahoe Basin management and restoration. Thus, the TSC represents a progression in the efforts to better integrate science practices and information into the myriad of resource management activities occurring in the Lake Tahoe Basin.

The TSC MOU committed the signatory entities to the completion of two specific products that would further define how the TSC would function: 1) development of a governance structure for the TSC; and 2) development of a structure defining the specific interactions between the agencies and research institutions. The research institutions are responsible for producing the first product, and this document is intended to fulfill that commitment. The second product has been fulfilled by the establishment of a new committee, the Tahoe Science-Agency Coordination Committee (TSACC), with specific responsibilities to integrate science and management within the existing interagency infrastructure.

This document begins by describing the objective and functions of the TSC. Next an organizational structure is described. Finally, the document describes the responsibilities and operating guidelines for each organizational entity in the TSC structure.

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<sup>1</sup>CONCUR. 2005. Final Letter Report. Work Group to Develop the Tahoe Science Consortium Lake Tahoe Basin, Nevada and California. Report to the Tahoe Regional Planning Agency and the US Army Corps of Engineer, Sacramento District. 18 pages.

## II. Objective and Functions of the TSC

As stated in the MOU, the primary objective of the TSC is to provide environmental managers and decision makers with comprehensive and well-synthesized findings drawn from research, monitoring, and modeling.

The TSC will work to achieve this objective by performing the following functions:

### ***a. Promote Scientific Advancement***

The TSC will provide an organizational capacity that supports ongoing science activities, including the development and dissemination of research, monitoring, and modeling efforts designed to supply decision-makers and managers with the most relevant and readily applied scientific information and products. Dependent on funding and resource constraints, the diverse activities of TSC scientific advancement include:

- Science Planning – Development of a comprehensive science plan for the Lake Tahoe Basin that describes key science activities, identifies critical management uncertainties, suggests approaches to reducing those uncertainties through research, modeling, and monitoring, and identifies data-gathering and information dissemination activities to best facilitate the development and application of new knowledge. The TSC also will work cooperatively with management agency representatives to regularly update the science plan to ensure the plan remains relevant to management needs.
- Independent Scientific Review – Provide objective, independent scientific review of proposed research (upon request) to ensure funded proposals are scientifically sound, consistent with the basin's science plan, compatible with previous research activities, and in compliance with the federal Data Quality Act (Section 515 of Public Law 106-554). Provide independent scientific review of technical work products or programs (upon request) to maximize the credibility of these products or programs by ensuring that data analyses and interpretations are appropriate and justified based on the work completed and the results of other relevant studies.
- Synthesis and Assessment – Promote and facilitate interdisciplinary research opportunities, and the completion of scientific assessments that integrate and synthesize scientific knowledge on key topics in the region.
- Scientific Outreach – Facilitate and engage in efforts to enhance collaboration, communication, and exchange of scientific information among scientists, agency representatives, and the public. These activities will include reaching out to research institutions that may be new to the Tahoe Basin, but can provide needed scientific expertise.
- Information Dissemination and Archive – Organize technical workshops and symposia aimed at clarifying the state of knowledge and reducing the uncertainty associated with complex resource management issues. Support the Tahoe Integrated Information Management System (TIIMS) efforts to compile, disseminate, and archive relevant data and information.

### ***b. Support Adaptive Management***

The TSC will contribute to the design and implementation of an adaptive management system for the Lake Tahoe Basin. Dependent on funding and resource constraints, the TSC will encourage and promote effective adaptive management strategies through the following contributions:

- Program and Project Design – Collaborate with resource management agency staff in the design of adaptive management programs and projects in key resource management issue areas. Assist in identifying adaptive management opportunities that enhance contributions to the basin's management directives. Assist in framing questions and testable hypotheses.
- Develop Monitoring Approaches – Cooperate with agencies in the development of effective monitoring plans, including goal setting, development of conceptual models, indicator selection, sampling design, data analysis, and interpretation of results.
- Inform Management – Assist agency representatives in the translation and evaluation of monitoring and research results, and in the integration of new knowledge into the development of resource management priorities and plans.

### ***c. Provide Scientific Consultation***

The TSC will serve as a source of scientific expertise. Upon request, the TSC will identify technical experts that can provide scientific information to Lake Tahoe Basin resource management agencies, the Lake Tahoe Federal Advisory Committee, and interested stakeholders. All aspects of land, water, and biological resource management in the Lake Tahoe Basin require the best available technical information to ensure that management, conservation, and restoration efforts are effective and efficient. In order to obtain credible and comprehensive technical documents that can inform management actions, the TSC will provide dependent on funding and resource constraints the following services on request:

- Document Review – Provide assistance to agencies by facilitating technical review of documents for scientific accuracy and consistency, and reviewing agency reports to identify specific contributions that may be incorporated into the larger, more integrative view of science and policy in the Tahoe basin.
- Planning Consultation – Work collaboratively with agencies and other stakeholders to ensure that planning documents are supported by the best available science.
- Project and Product Review – Provide assistance in the development of evaluation strategies for restoration projects to enhance their potential for contributing technical information useful in adaptive management processes. Assist in the review of information generated through specific initiatives to evaluate project performance and effectiveness.

- Project Design – Collaborate with resource agency staff in project design and implementation to ensure that relevant scientific information is obtained.
- Assess Resource Status and Trends – Develop white papers and reports that assess current risks and uncertainties in key resource issue areas.

### **III. TSC Organizational Structure**

The Tahoe Science Consortium is part of a larger effort to advance science, identify and address knowledge gaps, and accomplish the goals of adaptive management in the Tahoe basin (CONCUR 2005).<sup>2</sup> The Consortium structure described here is intended to support ongoing collaboration between science and management activities by providing focal points for regular interaction and communication (Figure 1). As illustrated in Figure 1, the standing structure of the TSC includes five separate, but closely coordinated, entities: 1) the TSC Executive Committee, 2) the TSC Executive Director, 3) the Committee of Scientists (COS), 4) the Peer Review Committee (PRC), and 5) the Science Community (SC). With the exception of the PRC, all of these entities are expected to have regular interactions and ongoing communication. Additionally, some individuals may be involved in multiple entities. The PRC will remain largely autonomous of the other entities to preserve its independence, which is critical to the performance of credible peer review services. The TSC Executive Director, COS, and SC will all interact and communicate with management agency representatives. These interactions will span all levels of the agencies to support the vertical integration of science-management information exchange. The composition, responsibilities, and operating guidelines for each TSC entity are described in Section V.

### **IV. TSC Membership and Commitments**

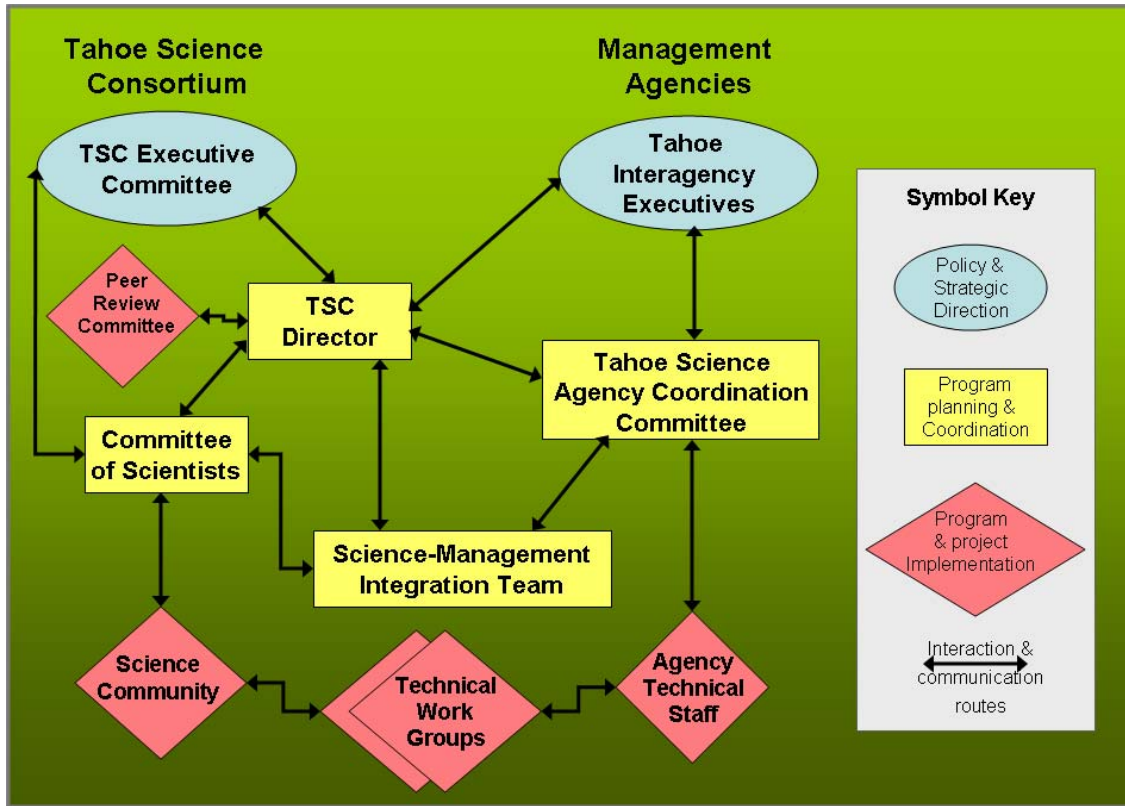
The TSC MOU (Attachment 1) together with this document will serve as the chartering documents for the TSC. To preserve its independence, the TSC will not become an official part of any one research entity. In addition, to allow full participation by government research entities, the TSC has determined that it will not at this time incorporate as a non-profit organization (i.e., a 501(c)3 non-profit organization).<sup>3</sup>

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<sup>2</sup>Much of the information presented in this section follows the descriptions and conclusions provided in the following report: CONCUR. 2005. Final Letter Report. Work Group to Develop the Tahoe Science Consortium Lake Tahoe Basin, Nevada and California. Report to the Tahoe Regional Planning Agency and the US Army Corps of Engineer, Sacramento District. 18 pages.

<sup>3</sup> The idea of establishing the TSC as a nonprofit organization was proposed during deliberations between science community and management agency representatives. This idea was considered a viable approach until some federal management agency representatives expressed concerns that establishing the TSC as a nonprofit organization could result in a conflict of interest that would exclude their participation.

**Figure 1.** Organizational structure to support ongoing integration of science activities and management issues in the Lake Tahoe Basin. This diagram identifies the entities involved and the routes of interaction and communication among the entities.



**a. TSC member Organizations**

TSC member organizations shall include academic research institutions and federal research agencies. Any bona fide research institution shall be eligible to join the TSC as a member organization at any time by signing the TSC MOU, by regularly participating in the activities of the TSC, and by agreeing to uphold the operating guidelines set forth in this document. Participation in the Science Community (see section V.e. for details) does not require membership in the TSC. An organization petitioning for TSC membership shall express its interest in joining the TSC through written communication addressed to the Executive Director. In that correspondence, the petitioning organization shall describe how it will meet the commitments of TSC member organizations (see section b below). The Executive Director shall notify representatives of the existing TSC member organizations upon receipt of such written communication. Membership in the TSC is contingent upon approval by a majority of the TSC Executive Committee members. Membership in the TSC shall not be reasonably denied, and the Executive Committee shall provide the specific reasons for denial in the event of such a decision. Upon approval of adding a new member, the petitioning organization will be invited to sign the TSC MOU. The TSC MOU shall be modified within 30 days to reflect such a change in membership

Any member organization of the TSC may terminate its membership at anytime without cause. Notice of intent to terminate membership shall be provided in writing from the Executive Committee representative to the TSC Executive Director. The TSC MOU shall be modified within 30 days to reflect such a change in membership.

### ***b. Commitments of TSC Member Organizations***

By signing the TSC MOU, member organizations of the TSC commit to fulfilling a suite of responsibilities necessary to ensure the TSC remains a viable and relevant organization. Specifically, each member organization commits to fulfilling the following responsibilities:

- Provide an executive level representative to serve on the Executive Committee. Each member organization is expected to provide time for the executive representative's participation at no cost to the TSC.
- Provide two representatives to serve on the Committee of Scientists. Both representatives are expected to fully engage in the activities of this committee. The intent is for each member organization to provide full representation on the COS, and for the collective representation to provide a diversity of scientific expertise and interests. Each member organization is expected to provide time for the representative's participation at no cost to the TSC. The anticipated annual time commitment of both COS representative is approximately 0.25 FTE/yr.
- TSC member organizations are expected to contribute staff to complete various tasks of the TSC, such as providing representatives to serve on organizing committees responsible for planning science conferences, symposia, or workshops for the Tahoe Basin.
- TSC member organizations are expected to contribute funding, when possible, to help sponsor Tahoe symposia, publications, and other science communication and outreach efforts.
- TSC member organizations must be willing to provide representatives to periodically serve as chairperson of a committee or lead a subcommittee charged with completion of a specific task or project.
- TSC member organizations are expected to promote the use of sound science practices in the Tahoe Basin and contribute to achieving the objective and fulfilling the functions of the TSC.
- TSC member organizations agree to uphold and abide by the TSC operating guidelines.

### ***c. Collaborating Resource Management Agencies***

Any federal, state, or local government agency with substantive interest in the welfare of the Lake Tahoe Basin shall be eligible to become a signatory to the TSC MOU as a resource management agency. Signatory resource

management agencies are considered cooperating partners in the TSC, and by signing the TSC MOU the agency is expected to collaborate with the TSC and its member organizations in fulfilling the intent of the MOU. However, cooperating partners do not accrue the rights or responsibilities of member organizations. Cooperating partners may interact and communicate directly with TSC representatives, or the interactions may occur through the appropriate management agency committees (Figure 1).

Potential new cooperating partners shall express their interest in joining the TSC through written communication addressed to the TSC Executive Director. The Executive Director shall notify representatives of the existing TSC member organizations and signatory resource management agencies upon receipt of such written communication. Joining the TSC as a cooperating partner is contingent upon approval by a majority of the TSC Executive Committee members. Signing onto the TSC MOU as a cooperating partner shall not be reasonably denied, and the Executive Committee shall provide the specific reasons for denial in the event of such a decision. Upon approval of adding a new cooperating partner, the petitioning organization will be invited to sign the TSC MOU. The TSC MOU shall be modified within 30 days to reflect a change in signatory resource management agencies.

Any signatory resource management agency may opt out of the TSC MOU at anytime without cause. Notice of intent to opt out shall be provided in writing from an agency senior executive to the TSC Executive Director. The TSC MOU shall be modified within 30 days to reflect a change in signatory resource management agencies.

Individual management agencies retain the authority to determine their level of interaction with the TSC. The TSC membership will fulfill its functions in an open and transparent manner, consistent with the ethical standards of an independent research institution and the operating guidelines set forth in this document. Both the resource management agencies and the TSC will maintain their independence in their respective decision-making functions and responsibilities.

## **V. TSC Composition, Responsibilities, and Operating Guidelines**

The composition, responsibilities, and operating guidelines of the five entities that comprise the TSC (Figure 1) are described in this section. This section also describes guidelines for other functions necessary to support the TSC and its operations.

### ***a. TSC Executive Committee***

The TSC Executive Committee is composed of research executives from each of the member organizations that have signed onto the TSC MOU. The Executive Committee will work with the Committee of Scientists (COS) and the TSC Executive Director to fulfill its responsibilities. Executive Committee members also may fulfill some responsibilities (e.g., public outreach) as individuals.

## **i. Specific Responsibilities**

The specific responsibilities of the Executive Committee are to:

Support the TSC – The Executive Committee will provide executive level support for the TSC and its operations. This includes supporting the activities of the COS and the Executive Director within their own institutions and through their individual or collective interactions with agency leaders and stakeholder representatives. The Executive Committee will have an ongoing responsibility to support all of the TSC efforts, as long as the TSC operates with high standards of integrity and objectivity.

Provide Advice – The Executive Committee will provide advice and strategic direction to the COS and the TSC Executive Director. This input will be used to shape the vision and guide the evolution of the TSC.

Appoint COS Members – Each Executive Committee member will appoint two individuals from their institution or agency to serve as members of the Committee of Scientists. In identifying COS members, the Executive Committee will take the following factors into consideration: 1) broad knowledge with respect to area of expertise; 2) balanced representation among the research institutions; and 3) the individual's commitment to contribute to the advancement of science in the Lake Tahoe Basin. Each member of the Executive Committee is expected to facilitate the process whereby their institution or agency provides time for the COS representative's participation at no cost to the TSC. The term of appointments shall be in accordance with the terms specified in section c below.

Executive Director Selection and Review – The Executive Committee is responsible for the selection and performance review of the Executive Director. At its discretion, the Executive Committee may choose to transfer these responsibilities to a subcommittee of its membership, which will serve as the Executive Director selection panel or review panel as appropriate. The Executive Committee may solicit input from the COS or choose to involve the COS chairperson(s) in fulfilling the subcommittee's responsibilities; however, all personnel decisions regarding the Executive Director are ultimately the responsibility of the Executive Committee.

## **ii. Number of Committee Members and Manner of Appointment**

Each academic institution or government research agency that has signed onto the TSC MOU as a member organization shall appoint one representative to serve on the TSC Executive Committee. Committee members are expected to hold executive positions within their organization (e.g., director, station chief, regional director, provost, or vice president/chancellor). The member organization shall have full discretion in selecting the Executive Committee representative for appointment. The Executive Committee shall not have officers or a chairperson.

### **iii. Terms of Office Vacancies and Removal**

Executive Committee representatives shall not have terms. Any Executive Committee member may resign after giving written notice to the committee and the Executive Director. Vacancies resulting from resignation, departure from a post, death, or an increase in the TSC membership, will be filled through appointment by the member organization within 30 days of verification that a vacancy exists.

### **iv. Committee Expenses**

Executive committee representatives shall serve without compensation. However, committee members may be reimbursed for travel and per diem expenses to attend committee meetings or perform other committee responsibilities requiring travel.

### **v. Committee Meetings**

The Executive Committee shall meet at least twice each calendar year. Generally, these will be joint meetings of the Executive Committee, Committee of Scientists, and the Executive Director. The Executive Director and the Committee of Scientists chairpersons will prepare the draft agenda for these meetings. Executive committee members will approve the final meeting agenda. The Executive Director (or his/her designee) is responsible for preparing meeting notes to document the discussions, action items, and decisions of the Executive Committee.

### ***b. TSC Executive Director***

The Executive Director is the first point of contact for the TSC. He or she will oversee the Consortium's day-to-day operations and serve as a strategic planner. The Executive Director is responsible for directing assignments made to COS members and for completing the work necessary to support the functions of the TSC and fulfill its primary objective. If sufficient funds are available, the Executive Director may employ staff (e.g., an administrative assistant or business manager) to assist with TSC operations. The Executive Director will lead tasks related to – among other things – outreach, program implementation, product delivery, work plan development and progress reporting, TSC administration, and peer review activities. Attachment 2 provides a more detailed list of the Executive Director's responsibilities. The Executive Director is expected to fulfill the responsibilities listed here and in Attachment 2, in collaboration with the COS.

The Executive Director will be an employee of one of the TSC member organizations (i.e., academic institution or government research agency). However, the Executive Director shall serve at the pleasure of the Executive Committee, which has the responsibility for selection and annual review of the Executive Director. During the first two years of full TSC operation (March 2006 to March 2008) the Executive Committee may appoint an interim Executive

Director by any means available to the committee. Beginning in 2008, the Executive Committee may undertake a national search to recruit and hire a permanent Executive Director. There is no time limit on the appointment of the Executive Director.

### ***c. Committee of Scientists***

The TSC Committee of Scientists (COS) is composed of two representatives from each of the TSC member organizations. Each Executive Committee member is responsible for appointing two representatives from their research institution or agency to serve on the COS. The COS will work with the Executive Committee, Executive Director, and the Science Community to fulfill its responsibilities. COS members also may fulfill some responsibilities (e.g., public outreach) as individuals.

#### **i. Specific Responsibilities**

The anticipated combined annual time commitment of the COS representatives is approximately 0.25 FTE/yr. Specific responsibilities of the COS include:

Support the TSC – The COS will provide ongoing support for the TSC and its operations. This includes supporting the TSC objective and functions, and supporting the activities of the Executive Director within their own institutions or agencies and through their individual or collective interactions with agency leaders and stakeholder representatives. The COS will have an ongoing responsibility to support all of the TSC efforts as long as the TSC operates with high standards of integrity and objectivity.

Engage in Committee Work – Each COS representative is expected to attend all meetings of the COS and fully participate in the work the committee assigns itself in fulfilling the TSC objective and functions. This may include serving on subcommittees, attending other meetings on behalf of the COS, preparing specific written products, or any other duties the COS may find necessary to fulfill the TSC objective and functions.

Science Resource – Each COS member will serve as a resource for scientific information and expertise in their field of knowledge. COS members will assist the TSC in fulfilling its primary objective by applying their expertise to advance the functions of the TSC and promote the use of sound science practices in the Tahoe Basin.

Outreach and Communication – COS members will serve as the consortium's primary conduit to the science community. This means COS members will stay abreast of the science activities occurring in the Lake Tahoe Basin. COS members also will work to understand management agency information needs and communicate those needs to the larger science community. The coordination of outreach efforts is important to ensure consistency and clarity in the information delivered. COS members will work to coordinate their outreach efforts.

Science-Management Integration Team – COS members will meet semi-annually or as needed with the Tahoe Science Agency Coordination Committee and the TSC Executive Director. These meetings will constitute the meetings of the Science-Management Integration Team (Figure 1). The purpose of the Science-Management Integration Team is to advance the use of science in resource management and management decisions affecting the Lake Tahoe Basin. These meetings will provide a forum to discuss management agency issues and the types of science activities that can help to address those issues. These meetings also will serve as a forum to receive the input needed to annually update/revise research and monitoring plans for the Lake Tahoe Basin.

Maintain TSC Functionality – The COS chairpersons have the responsibility to work with the Executive Director to ensure the TSC remains functional and fulfills its obligations. This may include advising and assisting the Executive Director on administrative or organizational matters, developing modifications to the TSC operating guidelines, or dealing with unforeseen circumstances. The COS chairpersons are the first point of contact for the Executive Director for any TSC-related matter.

Identify Funding Opportunities – COS members will remain alert to new sources of potential funding for the TSC. Information on potential funding opportunities will be forwarded to the Executive Director and COS for further consideration.

## **ii. Number of Committee Members and Manner of Appointment**

Each academic institution and government research entity that has signed on as a member organization of the TSC shall have two representatives on the COS. Executive Committee members shall appoint the COS representatives from their academic institution or research entity in accordance with the methods listed under the Executive Committee's responsibilities. Executive Committee members shall inform the TSC Executive Director in writing of the individuals they have appointed to serve on the COS.

## **iii. Terms of Office Vacancies and Removal**

COS members shall have two-year terms. COS appointments from a member organization shall be staggered so that the terms of the two representatives shall expire one year apart. COS members whose terms have expired can be reappointed at the discretion of their Executive Committee member, as long as the COS member is affirmatively contributing to fulfilling the responsibilities of the COS, as determined by the Executive Director and other COS members. Any COS member may resign after giving written notice to their respective Executive Committee member and the COS chairpersons. Vacancies resulting from resignation, departure from a post, death, or an increase in the number of research entities that have signed onto the TSC MOU as a member organization, will be filled by appointments made by the appropriate Executive Committee member. Any vacancy on the COS will be filled within 30 days of verification that a vacancy exists.

#### **iv. Officers**

The officers of the COS shall consist of two co-chairpersons with equal responsibilities and authority. Members of the COS shall nominate individuals to serve as a co-chairperson from the pool of COS representatives. Each COS member organization shall have one vote to cast for the nominee of that organization's choice. A simple majority of the votes (50% plus one) will determine which nominees are elected as chairpersons. The TSC Executive Director shall receive and tally all votes. The Executive Director will report the results to the COS. In the case of a tie vote, the current COS Chairpersons may at their discretion ask the TSC Executive Director to cast a tie-breaking vote or call for a re-vote. COS co-chairs shall serve a one-year term, and this term shall run from December 1 through January 31. Selection of the co-chairs shall be staggered, so that the terms expire one year apart. Any co-chairperson may be removed from office by a majority vote of the COS member organizations at any time.

#### **v. Duties of Committee Co-Chairpersons**

The Co-Chairpersons of the Committee of Scientists shall:

- Ensure the committee's adherence to the TSC operating guidelines.
- Work with the TSC Executive Director to prepare meeting agendas and preside over meetings of the COS.
- Work with the TSC Executive Director and COS to annually review the TSC responsibilities and operating guidelines, and prepare any recommended changes for COS review and approval.
- Establish subcommittees to perform specific tasks or complete specific assignments identified by the full committee.

#### **vi. Committee Expenses**

With the exception of the Co-Chairpersons, all COS members shall serve without compensation. However, COS members may be reimbursed for travel and per diem expenses incurred to attend COS meeting or perform other COS responsibilities requiring travel. If funding is available, the COS Co-Chairpersons shall receive an annual stipend of \$3,000 to be paid as soon as possible after the beginning of their appointment and in accordance with the policies of their employing institution.

#### **vii. Committee Meetings**

The COS will meet monthly or more frequently if necessary to discuss specific matters. COS meetings may occur in person, by video-conference, or teleconference. The Executive Director or his/her designee shall be responsible for preparing COS meetings notes, and for transmitting those meeting notes to all committee members. At a minimum, the meeting notes will document the discussions, action items, and decisions of the COS.

### **viii. Matters Requiring a Vote**

Selection of the COS Co-Chairpersons and modification to this document are the only COS decisions requiring a vote of the COS membership. The COS will strive to reach consensus on all other decisions it may make. Where consensus cannot be reached and at the discretion of a chairperson, the COS may choose to decide a matter by a vote of its membership. Each member organization shall have one vote to cast in all matters put to a vote of the COS, so that the total number of potential votes is determined by the total number of TSC member organizations. In all cases, a simple majority (50% plus one) will determine the outcome of a COS decision decided by a vote. In the case of a tie vote, the Chairpersons may at their discretion ask the TSC Executive Director to cast a tie-breaking vote, or call for a re-vote. Voting by the COS will not be complete until at least a quorum of the membership has voted. A quorum is defined as one-half of the number of COS member organizations plus one additional member organization. Votes may be cast by any means acceptable to the COS Chairpersons. COS meetings that do not involve a vote of the membership may proceed with or without a quorum.

### **d. Peer Review Committee**

The Peer Review Committee (PRC) is a standing committee within the TSC. The PRC is responsible for overseeing and administering all TSC peer review processes. The specific responsibilities and operating guidelines of the PRC are described in the TSC document, *Peer Review Processes for Science Activities Affecting the Lake Tahoe Basin* (Attachment 3).

#### **i. Number of Committee Members and Manner of Appointment**

The PRC will be composed of the TSC Executive Director and two members of the TSC Committee of Scientists (COS). The Executive Director is a permanent member of the PRC, while COS representatives will serve two-year staggered terms. Any COS representative may serve on the PRC, assuming he or she does not have a conflict of interest. The COS shall discuss the appointment of its members to the PRC during a regularly scheduled meeting. Decisions on appointments to the PRC shall be made by consensus. If a consensus decision is not possible, then the COS Chairpersons can put the matter to a vote of the COS following the procedures identified in section c.viii.

#### **ii. Terms of Office Vacancies and Removal**

COS members that serve on the PRC shall have two-year terms. PRC appointments shall be staggered so that the terms of the two COS representatives shall expire one year apart. PRC members whose terms have expired can be reappointed at the discretion of the COS, as long as the PRC member is affirmatively contributing to fulfilling the responsibilities of the PRC. Any PRC member may resign after giving written notice to the Executive Director and COS Chairpersons. Vacancies resulting from resignation, departure from a

post, or death, will be filled by appointments made by the COS following the process described in section i above. Any vacancy on the PRC will be filled within 30 days of verification that a vacancy exists.

### **iii. Committee Expenses**

All PRC members may be reimbursed for travel and per diem expenses incurred to attend PRC meetings or perform other PRC responsibilities requiring travel. If funding is available, the COS members serving on the PRC shall receive an annual stipend of \$3,000 to be paid as soon as possible after the beginning of their appointment and in accordance with the policies of their employing institution.

### **e. Science Community**

The Science Community (SC) will be open to all researchers active in the Tahoe Basin, or other scientists invited to participate by the TSC. The SC is not a formal entity, but rather an informal dynamic resource that is readily available to assist in fulfilling the functions of the TSC, such as increasing the diversity of scientific expertise available to inform decision-makers. The SC may interact directly with representatives of the resource management agencies or through the COS or Executive Director.

The TSC and resource management agencies will generally interact with the SC based on thematic or programmatic issue areas; examples include, but are not limited to air quality, restoration ecology, water quality, forest health, fire ecology, biological diversity, socio-economics, geology, and remote sensing. Organizing in this manner will facilitate integration of science and management, promote the development of research plans based on focused scientific expertise, encourage integrative and synthesis-based evaluations, and provide a center for broader attention, whereby new researchers can more easily integrate into the Tahoe Basin science community.

### **f. TSC Financial Administration**

Since the TSC is not incorporated as a legal entity, it will need to rely on one or more of the academic institutions in its membership to serve as the financial and administrative agent for any funding the TSC may receive. The academic institutions have agreed to rotate this responsibility among the participating entities every two years<sup>4</sup>. These institutions will develop an MOU detailing their financial and administrative responsibilities in support of the TSC.

### **g. Maintenance and Inspection of TSC Records**

The accounting books and financial records of the TSC shall be kept by the academic institution serving as the financial and administrative agent for the TSC. The TSC Executive Director shall maintain all other records and meeting

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<sup>4</sup> The TSC Executive Committee made this agreement during its May 3, 2006 meeting.

notes of the Executive Committee and Committee of Scientists. The Executive Director, or his or her designee also shall maintain the records associated with all TSC products and non-financial documents. All TSC records shall be kept in written or typed form, or in any other form capable of being converted into written, typed, or printed form.

Members of the Executive Committee and Committee of Scientists shall have the right to inspect all TSC financial records and documents during regular business hours, as long as sufficient notice is given and the request is within the existing policies of the institution serving as the financial and administrative agent for the TSC. This inspection may be made in person or by an agent, and shall include the right to copy and make extracts of documents.

#### ***h. Amendments***

The COS chairpersons and Executive Director shall review this document annually to determine the need for revisions or modifications. Any part of this document may be modified, amended or repealed by a simple majority vote of the COS at any duly called meeting of the COS at which a quorum is present. A quorum is defined as one-half of the number of COS member organizations plus one additional organization. Any change to the operating guidelines that is approved by a majority vote of the COS shall be transmitted to the Executive Committee for its review and approval.

## **Memorandum of Understanding**

### **Among Research Institutions:**

**University of California, Davis; University of Nevada, Reno; Desert Research Institute; U.S. Department of Agriculture, Forest Service Pacific Southwest Research Station; U.S. Department of Interior, Geological Survey; Sierra Nevada College;**

### **And Resource Management Agencies:**

**U.S. Department of Agriculture, Forest Service, Lake Tahoe Basin Management Unit; U.S. Department of Agriculture, Natural Resources Conservation Service; U.S. Department of Defense, Army Corps of Engineers; U.S. Department of Interior, Fish and Wildlife Service; U.S. Environmental Protection Agency; State of California; State of Nevada; Nevada Department of Transportation; Tahoe Regional Planning Agency**

## **Regarding the Tahoe Science Consortium**

**August 20, 2005**

The purpose of this Memorandum of Understanding (MOU) is to support the development of the Tahoe Science Consortium (Consortium), a membership of research institutions. The community of scientists at Lake Tahoe represents a broad spectrum of institutions and agencies and the undersigned recognize the benefits of collaboration with this community for science programs at Lake Tahoe. This MOU acknowledges the desire to develop a working relationship among Consortium member institutions and with participating resource management agencies supporting the preservation, restoration and enhancement of the unique environmental values of the Lake Tahoe basin.

The undersigned recognize that scientific inquiry, resource assessment, and interpretation of available data are critical for the development and implementation of effective environmental policy, and that use of the best available scientific information is required for resource managers to meet environmental standards for water and air quality, soil conservation, wildlife, fish and vegetation communities, as well as noise and scenic conditions, and recreation opportunities in the Tahoe basin.

The primary objective of the Consortium will be to provide environmental managers and decision makers with comprehensive and well-synthesized scientific findings drawn from research, monitoring, and modeling.

The Consortium and resource management agencies will:

- promote integration between current and future independent scientific projects,
- recommend priorities for future research based on a comprehensive science plan,
- foster a collaborative research environment that brings together disciplines and institutions,
- create an environment that promotes the contributions of new researchers,
- emphasize close cooperation between research scientists and land and resource managers to enhance the generation and transfer of scientific findings in the most effective manner,
- communicate the best available information to decision makers and other stakeholders in a timely and user-friendly manner, so that policies and decisions can be informed by the best available scientific knowledge and by syntheses of important contemporary findings,
- encourage a unified and collaborative scientific effort that takes full advantage of opportunities for multi-disciplinary and multi-institutional research endeavors.

This MOU is not an obligation of funds, nor a commitment of resources on behalf of any signatory agency, nor does this MOU abridge any decision-making authorities of any signatory agency.

The signatories to this MOU are committed to supporting the Tahoe Science Consortium with the intent of reaching a greater understanding of the elements, processes and forces that shape the dynamic environment of the Lake Tahoe basin, and the use of this knowledge toward achieving management objectives in the basin.

To these ends, this MOU hereby commits the research institutions that are signatories to this MOU to develop a governance structure for the Consortium within three months. It also commits both the research institutions and the resource management agencies to develop a structure defining the specific interactions between these two groups within the same time period.

**TAHOE SCIENCE CONSORTIUM  
MEMORANDUM OF UNDERSTANDING**

**SIGNATORY PAGE**

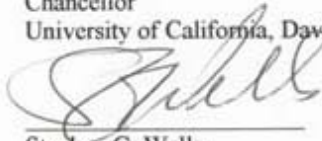
**August 20, 2005**



Larry N. Vanderhoef  
Chancellor  
University of California, Davis



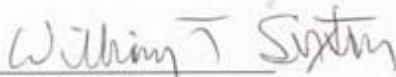
John M. Lilley  
President  
University of Nevada, Reno



Stephen G. Wells  
President  
Desert Research Institute



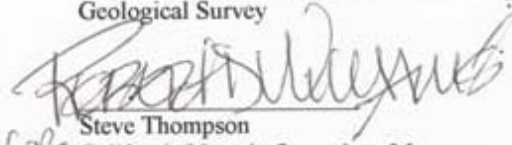
Garland Mason  
Deputy Station Director  
Pacific Southwest Research Station  
U.S. Department of Agriculture, Forest  
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William Sexton  
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Western Region  
U.S. Department of Interior,  
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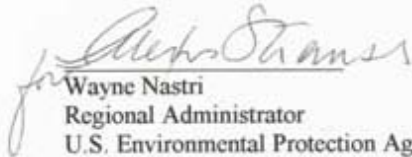
Paul Ranslow  
President  
Sierra Nevada College



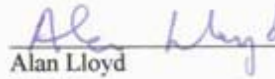
for Steve Thompson  
California/Nevada Operations Manager  
U.S. Department of Interior, Fish and Wildlife  
Service



Ronald N. Light  
Colonel, Corps of Engineers  
District Engineer  
U.S. Department of Defense



for Wayne Natri  
Regional Administrator  
U.S. Environmental Protection Agency



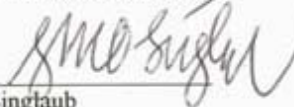
Alan Lloyd  
Secretary  
California Environmental Protection  
Agency



Mike Chrisman  
Secretary  
California Resources Agency



Allen Biaggi  
Director  
Nevada Department of Conservation and  
Natural Resources




John Singtaub  
Executive Director  
Tahoe Regional Planning Agency

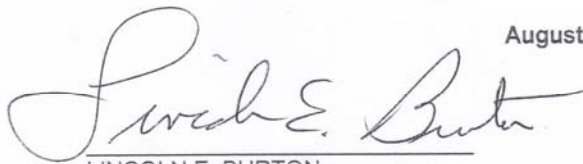
**TAHOE SCIENCE CONSORTIUM  
MEMORANDUM OF UNDERSTANDING**

**SIGNATORY PAGE**

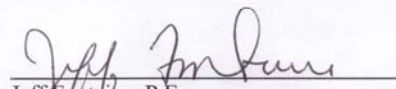
**August 4, 2006**

  
Terri Marceron  
Forest Supervisor  
Lake Tahoe Basin Management Unit,  
U.S. Department of Agriculture, Forest Service

**August 17, 2006**

  
LINCOLN E. BURTON  
State Conservationist  
Natural Resource Conservation Service,  
U.S. Department of Agriculture

**September 7, 2006**

  
Jeff Fontaine, P.E.  
Director  
Nevada Department of Transportation

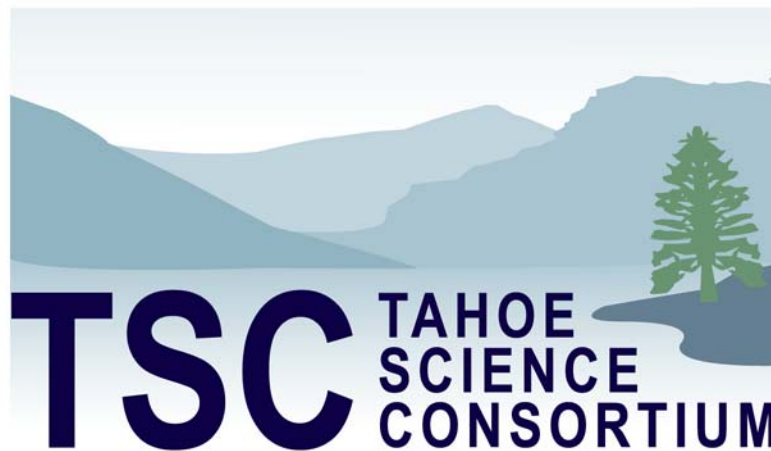
## **Statement of Work for the Tahoe Science Consortium Executive Director**

The Executive Director will pursue the following activities in support of the Consortium's functions and to fulfill its primary objective:

1. Work within the Tahoe Science Consortium (TSC) to promote scientific advancement, support adaptive management, and provide scientific consultation in the Lake Tahoe Basin.
2. Work cooperatively with the Committee of Scientists (COS) and management agency representatives to integrate science practices and information into the myriad of resource management activities occurring in the Lake Tahoe Basin.
3. Work with the COS to:
  - a. Develop and maintain a long-term, comprehensive science plan that addresses the research needs within the Lake Tahoe Basin.
  - b. Develop and implement an independent scientific peer review process for research proposals and products related to Lake Tahoe Basin restoration.
  - c. Provide scientific input and advice to management agencies through scientific consultation, information transfer, and outreach.
  - d. Achieve ongoing coordination and communication between the TSC and resource management agencies.
  - e. Develop an annual work plan for the TSC and complete the tasks necessary to fulfill work plan obligations (e.g., complete progress reports).
  - f. Serve as the TSC point of contact for the institution administering TSC funding or contracts.
4. Work with scientists and agency representatives to create an environment that promotes the contributions of the best available science, and ensures science efforts are carried out in an applied and integrative manner.
5. Work cooperatively with land and resource managers to facilitate the transfer of science information in an effective manner.
6. Communicate with decision-makers (e.g., the Tahoe Interagency Executives) in a timely and user-friendly manner, so that new policies will benefit from current science efforts, and existing policies can be adjusted to benefit from new findings.

*Attachment 3.*

*Peer Review Processes for Science  
Activities Affecting the Lake Tahoe Basin*



October 9, 2007

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## Introduction

Peer review is an objective process used to evaluate proposals for new projects and results from completed projects. The practice of peer review is used in many types of business, technology, and enterprise activities where there is an interest in maximizing cost effectiveness, credibility, and success. Peer review practices are often thought of in the context of science activities; however, rigorous peer review has been a hallmark of the modern scientific method only since the middle of the twentieth century.

The classical definition of a *peer* is “a person who has equal standing with another or others” (American Heritage, 1992). A *peer review*, then, is a review of one or more person’s work by others of equal standing. In the sciences, someone of equal standing is generally considered to have an equivalent level of experience and recognized expertise in the research area of interest. Although peer reviews are critical in nature, the process is intended to improve the quality, certainty, and credibility of the work product. Independent peer review is considered one of the best ways to identify oversights, mistakes or flaws in a proposed or completed piece of work. The complexities of scientific endeavors often mean that opportunities for improvement are apparent only to someone with specialized expertise or experience. Thus, allowing others to review the work of their peers increases the probability that strengths will be identified and supported, or that weaknesses will be identified and corrected.

In scientific work, the peer review process is most commonly associated with the publication of manuscripts or journal articles. However, the peer review of research proposals is often a required step in the decision-making processes used to determine and/or direct funding for new science activities. Used in this manner, the review process works to directly increase the confidence of funding decisions. Today, many consider independent and unbiased peer review of both proposed and completed scientific work an essential component of the scientific process. For example, the Federal Office of Management and Budget produced a final bulletin (OMB 2004), which “establishes that important scientific information shall be peer reviewed by qualified specialists before it is disseminated by the federal government.”

## Principles Guiding Peer Review

The procedures described in this document are based on the principle that effective peer review improves the acquisition, analysis and reporting of scientific information. However, to ensure the credibility of the peer review process itself, the process must be:

- **Unbiased.** Those managing the review process and the reviewers cannot have conflicts of interest that prevent them from providing objective information.
- **Fair and ethical.** All parts of the review process must ensure the fair and ethical treatment of the participants and the products undergoing review.

- **Transparent.** Regular and broadly-disseminated communication about the review process must be shared in a timely manner with all interested parties.

These are the guiding principles underlying the peer review processes described in this document.

## **Factors Critical to Effective Peer Review**

Kostoff (1997) identified eight factors critical to an effective peer review program. These factors are listed below in order of priority. All of the factors must be addressed in order to maintain a successful peer review program on a sustained basis:

1. High-level commitment from the organization(s) requesting the review, to follow processes that will obtain high-quality reviews. It is a waste of effort and funds to conduct a peer review unless senior management: a) supports the time and expense to conduct rigorous reviews, and b) is fully committed to using the review results in subsequent management decisions.
2. Commitment of the review manager or review committee to administer a credible and transparent peer review process. The review manager or committee oversees implementation of the peer review process. This can include development of the review charge or criteria, guiding the questions and discussion in a panel review, synthesizing and summarizing the reviewers' comments, and recommending follow-on actions. Often the review manager has the latitude to select the review process and criteria, and generally has the latitude to select reviewers by a non-random process. The review outcome can be substantially influenced before the process begins, if the review manager or committee does not follow the highest standards in establishing the review process and selecting reviewers.
3. Obtain highly competent and objective reviewers. Each reviewer must be technically competent in his or her subject area, and the competence of the total review group for any specific document should cover the multiple facets of research issues identified in the product submitted for review. In addition, the review group's expertise should not be limited to sub-disciplines of the specific research area under review (which addresses the question of whether the job is being done right), but should be broadened to the area covered by the highest-level objectives of the research (which addresses the question of whether the right job is being done). This will help insure that outmoded but prolific and well-cited research is not promulgated in perpetuity, and that the fresh perspectives of new paradigms are considered equitably.
4. Maximize normalization and standardization across panels and disciplines. For disciplines which have some similarities, use of common reviewers among the panels can provide some degree of standardization.

For very disparate disciplines, some allowances need to be made for the relative strategic value of each discipline to the organization, and arbitrary corrections applied for scoring differences and biases. Even in the case of disparate disciplines, some normalization is possible by having some common reviewers with broad backgrounds evaluating the diverse programs and projects. The use of a technical synthesis panel also can help to normalize the results of individual review panels.

5. Select relevant evaluation criteria. In evaluating basic research proposals, the four main criteria are research merit, research approach, realistic budget, and team quality. The evaluation of research approach and team quality together provides insights into the likelihood of success. Use of a fifth criterion: research relevance is often essential in evaluating applied research proposals.
6. Maintain reviewer anonymity. If honest and frank viewpoints on the intrinsic quality of the research under review are desired, the reviewer must remain anonymous to all but the review manager. Rewards are few for a reviewer making strong negative statements about a proposal (or research paper or program), and resulting retributions and resentments to the reviewer may far outweigh the intrinsic benefits to science of honest and forthright statements.
7. Maintain high ethical standards. Using peers to conduct reviews does present an inherent conflict: peers may be in a position to compete for future research funding or positions. This raises the potential for several ethical conflicts including scientific fraud, scientific misconduct, betraying confidential information, and unduly profiting from access to privileged information. To mitigate ethical conflicts, it is increasingly common to request reviewers to sign documents agreeing to maintain high ethical standards and confidentiality as a condition of their participation in the review process.
8. Be prepared for the full cost of peer review. The true total costs of peer review can be considerable, but tend to be ignored or understated. The major contributor to total cost is the time of all individuals involved in executing the review, including staff and reviewers. There are also costs associated with the synthesis and reporting of review results. Costs must be considered carefully in designing a high quality peer review process.

### **Peer Review Services Provided by the TSC**

The Tahoe Science Consortium (TSC) was formed in August 2005 through a memorandum of understanding among research institutions and resource management agencies active in the Lake Tahoe Basin. The purpose of the TSC is to provide environmental managers with well-synthesized scientific findings drawn from research, modeling, and monitoring. As an entity that operates independently of the agencies funding science activities in the Tahoe Basin, the

TSC is well positioned to organize and administer the independent peer review of science proposals and science work products.

The TSC has received funding to administer the peer review of proposals submitted in response to the Lake Tahoe Science and Research request for proposals. Approximately \$3.7 million is available annually through the Southern Nevada Public Lands Management Act to fund new research in the Lake Tahoe basin. The TSC is prepared to work with Federal sponsors to complete this peer review using the processes described in this document. Upon request, the TSC also is prepared to administer the peer review of scientific products or technical programs using the processes described in this document. The TSC has not received funding to administer the review of scientific products or technical programs, but the TSC is willing to provide these services if supplementary external funding becomes available. The federal Office of Management and Budget authorizes federal agencies “to commission an entity independent of the agency to select peer reviewers and/or manage the peer review process” in accordance with its *Final Information Quality Bulletin for Peer Review* (OMB 2004). The TSC is prepared to serve as this entity using the peer review processes described in this document.

Following models employed by the National Institutes of Health and the Health Effects Institute, the TSC has formed a separate Peer Review Committee (PRC). Although scientists from the member organizations of the TSC may produce work products that could end up in a peer review process administered by the PRC, the TSC will ensure that any peer review processes it administers will be credible, transparent, and unbiased. Therefore, PRC members will be required to recuse themselves from involvement in any TSC administered peer review that could present a conflict of interest. In addition, all PRC members will be required to complete conflict of interest, confidentiality, and non-disclosure forms for any review they participate in. These steps are intended to maintain high ethical standards of all review participants.

## **Application of the Peer Review Process**

In complex ecological systems, such as the Lake Tahoe Basin, where science activities are undertaken to produce information that addresses gaps in knowledge, reduce uncertainty and inform decision-makers, independent and unbiased scientific review can be applied at multiple stages:

The Proposal Stage: The review of proposals for new science is intended to improve the quality of the experimental design associated with the research, monitoring or adaptive management project being suggested.

The Project Stage: The review of products (e.g., reports and manuscripts) from completed projects ensures that analysis and interpretation of data are appropriate and justified based on the work completed and the results of other relevant studies.

The Program Stage: Reviews at this level are intended to provide expert advice and ideas about how to obtain the scientific information that best meets

management needs or policy goals and to provide feedback on the quality of the science underpinning program activities.

The remainder of this document describes the review processes the TSC will use to complete independent peer reviews under each stage.

## **Peer Review Process for Science Proposals**

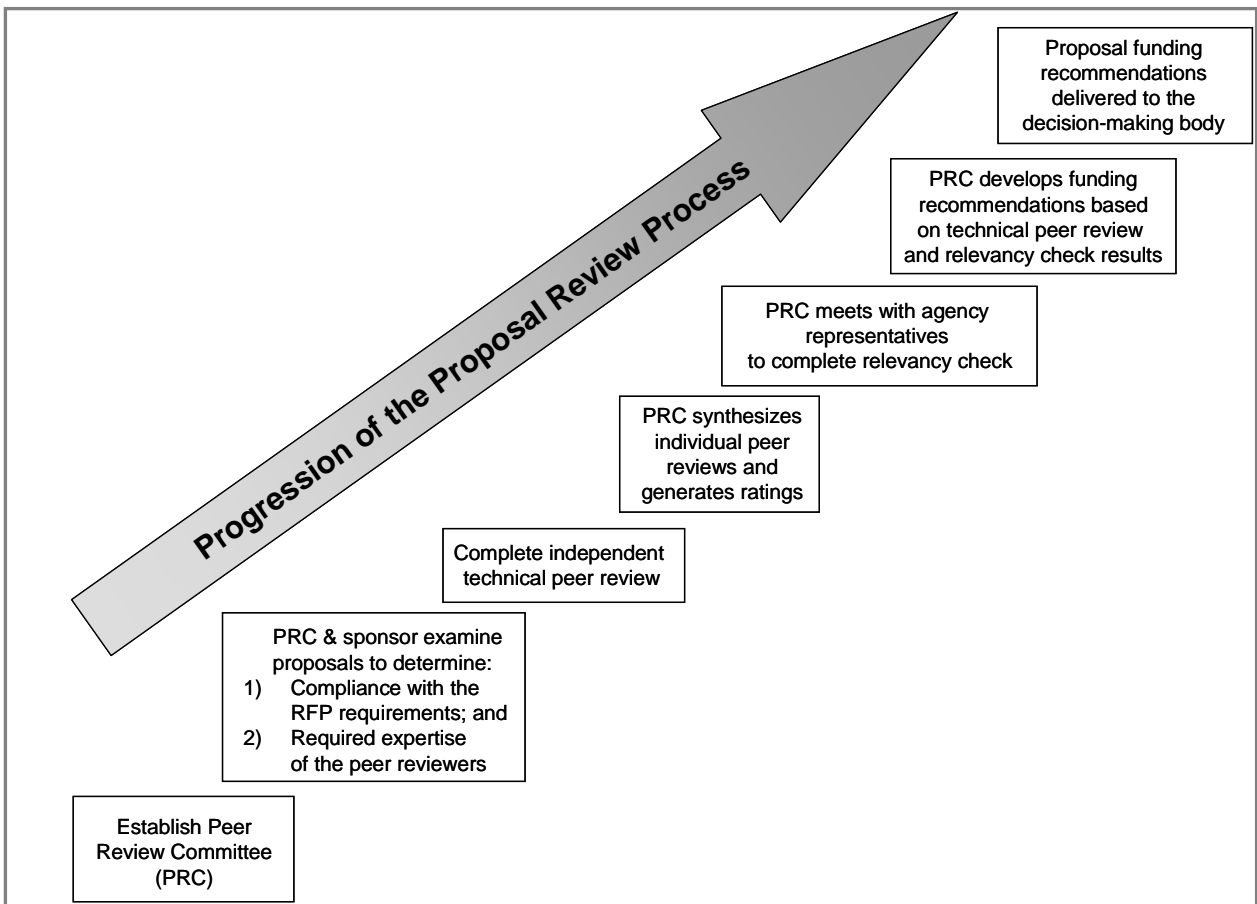
The management and conservation of complex ecological systems require projects and programs that obtain information to inform decision-making and support management actions. Funding agencies often use competitive processes or special initiatives to solicit for proposals aimed at obtaining information that addresses gaps in knowledge and reduces uncertainty. Their goal is to fund proposals that are high priority from a programmatic standpoint (i.e., address key uncertainties or knowledge gaps) and high quality from a technical standpoint.

The purpose of the proposal peer review process is to obtain independent and credible evaluations of a proposal's technical merits. Using independent experts to evaluate the technical quality of research and project proposals is standard practice within organizations such as the U.S. Environmental Protection Agency, National Science Foundation, and National Institutes of Health. An objective, technical peer review process is essential to identifying the highest quality proposals and avoiding biases that can result from reviews by a small group of "in-house experts" who might not have the required level of technical background. The collective results of this peer review process are used to generate ratings of technical quality for the entire group of proposals.

It is increasingly common to see an independent peer review process embedded in the overall proposal selection process. In addition to informing funding agencies about the technical quality of submitted proposals, the peer review process can help to promote funding processes that are transparent and fair to all applicants. This section describes the processes for the independent peer review of science proposals received both through an open solicitation (hereafter referred to as a request for proposal or RFP) and through an agency-sponsored special initiative. Overall, the processes are identical with the exception of the steps to determine programmatic relevance.

### **Review of Science Proposals Received in Response to Requests for Proposals**

A multi-staged, independent peer review process is used to evaluate and prioritize science proposals received in response to a request for proposal. Figure 1 provides an overview of the major steps in this process. Details associated with each step are described below.



**Figure 1.** Diagram illustrating the major steps in the peer review process for science proposals submitted in response to an RFP.

Establish a Peer Review Committee (PRC). The PRC is responsible for overseeing and administering the proposal peer review process. The PRC is composed of the TSC Executive Director and three members of the TSC Committee of Scientists (COS) or their designees. The PRC will be a standing committee. The Executive Director is a permanent member of the PRC, while COS representatives will change over time. To avoid conflicts of interest and maintain high ethical standards, PRC members will be required to:

Recuse themselves from involvement in any TSC administered peer review that includes a proposal, work product, or technical program in which they have materially contributed<sup>5</sup>.

Recuse themselves from the consideration of any proposal submitted from their home institution.

<sup>5</sup> A person is considered to have materially contributed to a proposal, work product, or technical program if they: 1) are listed as an investigator or co-investigator, 2) directly contributed to the production of the document undergoing review, or 3) received funding to complete any work that directly contributes to the product undergoing review.

Complete conflict of interest, confidentiality, and non-disclosure forms (Appendix A) for any proposal review they complete.

The PRC is responsible for the following tasks:

One or more PRC representative(s) will work with representatives from the agency sponsoring the RFP to examine the submitted proposals to ensure they fulfill all requirements stated in the RFP. This is an administrative step to ensure each proposal contains the information necessary for a thorough peer review. Only proposals fulfilling all RFP requirements will be distributed for external peer review.

The PRC will examine the RFP and the submitted proposals to determine the areas of scientific expertise that must be represented by the peer reviewers. The PRC will select the peer reviewers based on: 1) required expertise, 2) reviewer independence and standing in the scientific community, and 3) reviewer availability. Reviewers may be selected from academia, government or private consulting companies, and may or may not have worked in the Lake Tahoe basin.

The PRC will establish the technical review criteria. These review criteria will be used by all peer reviewers to evaluate individual proposals. The review criteria will normally include all of the factors listed in Appendix B; however, the criteria may be adjusted depending on details specified in the RFP or in consultation with the sponsoring agency.

The PRC will establish the overall review timeline. The timeline will largely be determined by the number of proposals requiring review and the number of proposals each peer reviewer agrees to review.

Establish the group of independent peer reviewers and obtain reviews of each proposal. The PRC will develop a list of potential reviewers and contact individuals to confirm their willingness to serve as a peer reviewer. Each proposal will be evaluated by a minimum of three reviewers. The independent technical reviewers must not have a direct affiliation (past or present) with the authors of the proposal(s) they review, or have other associations with the authors that might raise a conflict of interest issue. All reviewers will be required to sign conflict of interest, confidentiality, and non-disclosure forms (Appendix A). The reviewers also must be knowledgeable about the research area in the proposal; however, to avoid a conflict of interest, they cannot have current involvement in any Lake Tahoe basin research project. Steps to obtaining the peer reviews are as follows:

The proposals and review criteria will be sent by email or surface mail to the assigned reviewers. The reviewers will complete a critical review of the technical merits of each assigned proposal, using a standardized scoring form based on the review criteria (Appendix B).

Reviewers will return the proposals, the completed scoring forms, and completed conflict of interest forms to the PRC. Reviewers will be compensated approximately \$100 for their time to complete each proposal review.

Synthesize the individual peer reviews to determine the rating of each proposal. The PRC will examine all of the peer reviews to ensure they are complete and supportable. The PRC will calculate an average numerical rating using the reviewer's rating values to determine the overall technical rating of each proposal. Proposals receiving highly divergent reviews (i.e., final rating scores that differ by two or more) will receive additional review either by the PRC or by another independent reviewer. The overall technical rating will be used to determine if a proposal receives further consideration or not according to the categories and considerations described in Appendix C. For RFP's that identify multiple research theme areas, the PRC has the option to group proposals and the associated ratings by theme area.

Evaluate proposal relevancy to management and regulatory agency information needs. The proposals passing the technical review step will be forwarded to management and regulatory agencies for a relevancy review. These proposals will be discussed in a meeting generally referred to as the "relevancy check." The purpose of this meeting is to allow for agency input into the development of funding recommendations for the most technically sound proposals. The relevancy check will use the criteria listed below. Relevancy check discussions will be co-led by a PRC representative, who is responsible for ensuring the discussions are balanced, fair, and comprehensive.

- Does the proposal meet one or more of the priorities identified in the RFP?
- Will the proposal provide timely information of relevance to management needs?

Evaluate technical and relevancy review results to develop funding recommendations. The PRC will evaluate all review results to derive a set of proposals recommended for funding. Generally, the PRC will aim to select proposals of top technical merit and high agency relevance (the upper left-hand corner of Table 1). However, some

deviations may occur given funding constraints, or other factors such as balancing research investments across theme areas consistent with the funding targets described in the RFP.

Table 1. Scientific merit and policy relevance evaluation matrix.

Scientific/Technical Merit Scores <sup>2</sup>	Policy/Management Relevance <sup>1</sup>		
	High	Medium	Low
5.0-5.9 (Superior)			
4.0-4.9 (Good)			
3.0-3.9 (Average)			

<sup>1</sup> Output of the committee/entity conducting the relevancy check.

<sup>2</sup> Calculated from scores provided by independent peer reviewers.

Present proposal funding recommendations. The PRC will present proposal funding recommendations based on the technical peer review results and relevancy check discussions to the agency sponsoring the RFP. Representatives of the sponsoring agency will have the opportunity to ask questions about any step in the proposal review process including the relevancy check discussions. The sponsoring agency will use the information provided to adopt its own set of funding recommendations.

### **Review of Science Proposals Received Through a Special Initiative**

Special initiatives proposed by individual or collaborating agencies, by their nature, are usually intermittent in character; however, it may be appropriate to conduct an independent peer review of proposals submitted in response to a special initiative to ensure the highest possible science quality. With the exception of the relevancy check, the processes described above for the review of science proposals received through an RFP will be used to review special initiative proposals. Whenever an agency or agencies request the review of special initiative proposals, it is assumed that: 1) the proposed project has already met the necessary relevancy check for that agency, and 2) there is already agreement among the funding agency/agencies that the proposed project will address a high priority need. The Peer Review Committee's responsibility in these circumstances is to administer an independent peer review to evaluate the technical merit of the proposed project. Peer review results will be summarized by the PRC to develop overall ratings, and a funding recommendation will be presented directly to the requesting agency or agencies.

### **Peer Review Process for Science Products**

The independent peer review of work products from completed science projects generally follows the same procedures used to review science proposals: the Peer Review Committee (PRC) oversees an independent technical review, followed by the synthesis and reporting of review results. However, since the

science products submitted for review may only comprise a portion of the complete product (e.g., technical sections of an environmental impact statement or a regional plan), a review charge must be developed to ensure the peer review focuses on evaluating the technical work and associated results. As with the review of science proposals, the PRC members and independent technical reviewers of science products may not have a direct affiliation (past or present) with the authors of the products they review, or have other associations with the authors that might raise a conflict of interest issue.

Three critical ingredients must exist before a science product review can occur:

- 1) A well defined product (e.g., a complete report or manuscript or a functioning model with documentation) amenable to review by someone who has relevant expertise, but is not associated with the specific project.
- 2) A clearly described review charge that documents the scope of the review and reviewer's tasks. Peer review is most powerful when the charge is specific and steers the reviewers to specific technical questions while also directing reviewers to offer a broad evaluation of the product (OMB 2004).
- 3) A clear understanding of how the review results will be used. Specifically, the agency or entity requesting the review needs to identify in advance of the review, the types of actions that may occur in response to the review. Appropriate actions may include a simple response to comments, revision of the science product to address errors and/or omissions, completion of additional analyses or studies deemed critical to verifying an underlying assumption or addressing remaining uncertainties, reconsideration of the results and conclusions after addressing flaws identified through the peer review, or some combination of these or other actions (OMB 2004).

Independent peer review of completed science products may be obtained from individual scientists via email or surface mail, or as panel reviews (OMB 2004). In a mail review, the product and review charge are sent to selected reviewers, reviews are completed individually, and reviewer's comments are returned for synthesis by the PRC. In a panel review, the selected reviewers are asked to form a review panel that works together to complete a comprehensive review; the panel then provides a single document describing the review results. Panel reviews generally begin by mailing each panel member the review charge and documents for review. Panel members may be asked to participate in a meeting or workshop where they can receive additional information about a project, ask specific questions of the project investigators, or receive other points of view. The panel member's then work together to prepare a single review panel report.

Panel reviews are particularly appropriate for large, multifaceted projects where large uncertainties may exist, or for topics linked to controversial management actions. In both cases (individual review or panel review) the PRC is tasked with overseeing the process. The PRC is also responsible for examining review results to ensure they meet the review charge before delivering the results to the agency or entity requesting the review.

Compensation for the review of science products will be greater than the compensation for proposal reviews and will vary depending on whether individual reviews or a panel review process is used. Normal compensation for an individual review is \$200. Each panel member will be compensated \$200/day plus travel expenses for their participation in a panel review. Compensation will cover preparation time, panel meeting participation, and panel report preparation.

## **Peer Review Process for Technical Programs**

The review panel approach described for the peer review of science products will be used to obtain independent peer review of technical programs. Technical programs will generally have a number of products produced through several projects that together comprise the program. The development of technical tools for the Lake Tahoe TMDL and the associated results are an example of a technical program. As with the review of science projects, the review of technical programs requires all three critical ingredients: well defined products, a clear review charge, and a clear understanding of how the review results will be used. Because of the complexity involved, reviews of technical programs will take longer than the review of a science product. Also, reviewers will need to spend time with those active in the program to gain a comprehensive understanding of the overall program. This may require multiple meetings between the reviewers and those active in the program. PRC members and the independent peer reviewers of a technical program may not have a direct affiliation (past or present) with the program, or have other associations with the program participants that might raise a conflict of interest issue.

Reviews of technical programs are specifically designed to provide expert advice and ideas about how to develop scientific information that best meets the management needs or policy goals, and to provide feedback on the quality of the science underpinning the program activities and results. Reviews of technical programs will not judge policies or the management basis for establishing the program, nor will they provide recommendations for new policies (OMB 2004). Compensation for the review of technical programs will follow the formula used for the compensation of science product reviews.

## **Transparency in the Peer Review Process**

An open and transparent review process is critical to the sustained success and credibility of any peer review program (OMB 2004). Effective communication is essential during all phases of a review to ensure transparency in the review process. Details are provided below about the types of information that will be communicated at the initiation of the review, during the review, and at the conclusion of the review.

Communications at the initiation of the review. Once the Peer Review Committee (PRC) accepts responsibility for administering a review, it will disseminate an announcement identifying the members of the PRC, describing the type of review the PRC will oversee, the major

steps in completing the review, and the associated timeline. For proposal reviews, initial communications will include general statistics on the number and topical categories of the proposals received, and results of the administrative review (i.e., the number of proposals meeting the RFP requirements). For the review of science products or technical programs, communications also will include identification of the documents to be reviewed and a description of the review charge.

Communications during the review. The PRC is responsible for all communications during the review. Individual reviewers will remain anonymous. Communications during the review will consist of updates on the status of the review.

Communications at the conclusion of the review. The PRC is responsible for communicating the final results of any review it oversees. In all cases, review results will be communicated to the agency or entity that requested the review. For proposal reviews, the PRC will communicate the results of the individual reviews, the results of its rating synthesis, and the funding recommendations developed through the relevancy check. Proposal review results also may be transmitted to the proposal authors. For reviews of science products or programs, the PRC will communicate the results of the individual reviews and its synthesis (in the case of mail reviews) or the final report from the peer review panel.

It is increasingly common for entities to provide communications about a peer review process via an internet web page. Using a web page to disseminate review information has greatly enhanced the ability to provide interested parties with the same information in a timely manner. For example, using electronic review forms that individual reviewers can download and complete on their computer helps contribute to a more timely process. Regular communication during all phases of a review combined with the dissemination tools available through an internet web page can go a long way to ensuring any review process remains transparent and timely.

## **Conflict of Interest, Confidentiality and Non-disclosure Rules**

Maintaining high ethical standards throughout the peer review process is critical to the overall credibility and success of the review. The National Academy of Sciences defines “conflict of interest” as any financial or other interest that conflicts with the service of an individual reviewer because it could impair the individual’s objectivity or could create an unfair advantage for a person or organization (NAS 2003). Thus, a breach of ethics or conflict of interest can arise for several reasons, so care must be exercised to consider all potential sources. The review processes described in this document are patterned after

national programs, and similarly the ethic standards and conflict of interest provisions follow those used by the National Institutes of Health. All peer reviews described in this document will use the forms in Appendix A. Peer reviewers and members of the Peer Review Committee overseeing the review will be required to review and complete these forms. These forms rely on the integrity of individual participants, which is ultimately the basis for maintaining high ethical standards and avoiding conflicts of interest.

## **Literature Cited**

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## Appendix A

### Conflict of Interest, Confidentiality and Non Disclosure Rules and Information for Reviewers<sup>6</sup>

As reviewers themselves are most familiar with their own situations, it is their personal responsibility to: (1) alert the Peer Review Committee (PRC) to any possible conflict of interest situation, whether real or apparent, that may impact the review, and (2) identify and certify on the pre-meeting and post-meeting Conflict of Interest Certification Forms associated with this information sheet, (a) any application where they have a conflict of interest, and (b) that they will not be, and have not been, involved in the review of any application where their participation constitutes a conflict of interest. Reviewers must also certify that they will maintain the confidentiality of the proceedings and associated materials and that they will not disclose to another individual any matter or information related to the review proceedings. In addition, the PRC may determine that a particular situation involves a conflict of interest and require that the potential reviewer not be involved in the review of the application(s) or proposal(s) in question. All reviewers are covered by this information sheet and associated Certification Forms.

**There are several bases for a conflict of interest: employment, financial benefit, personal relationships, professional relationships or other interests.** If applicable, any one condition may serve to disqualify a reviewer from participating in the review of an application or proposal. A **conflict of interest may be real or apparent.**

The following guidance and definitions, derived from federal regulations governing the Scientific Peer Review of Research Grant Applications and Research and Development Contract Projects (42 CFR Part 52h), will assist you in determining whether you are faced with a real or apparent conflict of interest. The guidance is not all-inclusive, due to the variety of possible conflicts of interest. Therefore, it is important that you should consult the PRC when there is any question about your participation in a review.

#### GUIDANCE AND DEFINITIONS

A **Conflict Of Interest** in scientific peer review exists when a reviewer has an interest in a proposal that is likely to bias his or her evaluation of it. A reviewer who has a real conflict of interest with a proposal may not participate in its review.

**Real Conflict Of Interest** means a reviewer or a close relative or professional associate of the reviewer has a financial or other interest in a proposal that is known to the reviewer and is likely to bias the reviewer's evaluation of that proposal as follows:

A reviewer shall have a real conflict of interest if he/she or a close relative or professional associate of the reviewer: (1) has received or could receive a direct financial benefit of any amount deriving from funding a proposal under review; (2) has received or could receive a financial benefit from the applicant institution, offeror or principal investigator that in the aggregate exceeds \$10,000 per year; this amount includes honoraria, fees, stock or other financial benefit, and additionally includes the current value of the reviewer's already existing stock holdings, apart from any direct financial benefit deriving from an application or proposal under review; or (3) has any other interest in the proposal that is likely to bias the reviewer's evaluation of that application or proposal.

Regardless of the level of financial involvement or other interest, if the reviewer feels unable to provide objective advice, he/she must recuse him/herself from the review of the application or proposal at issue. The peer review system relies on the professionalism and integrity of each reviewer to identify to the PRC any real or apparent conflicts of interest that are likely to bias the

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<sup>6</sup>Documents in this appendix follow forms and guidelines used by the National Institutes of Health, Office of Extramural Research.

reviewer's evaluation of an application or proposal.

**Employment:** A reviewer who is a salaried employee, whether full-time or part-time, of the applicant institution, offeror, or principal investigator, or is negotiating for employment, shall be considered to have a real conflict of interest with regard to an application/proposal from that organization or principal investigator. The PRC may determine there is no real conflict of interest or an appearance of a conflict of interest where the components of a large or multi-component organization are sufficiently independent to constitute, in effect, separate organizations, provided that the reviewer has no responsibilities at the institution that would significantly affect the other component.

**Financial Benefit:** See definition of Real Conflict of Interest above.

**Personal Relationships (Relatives):** A close relative means a parent, spouse, sibling, son or daughter or domestic partner. A conflict of interest exists if a close relative of a reviewer submits an application or proposal, or receives or could receive financial benefits from or provides financial benefits to an applicant or offeror. In such case, it will be treated as the reviewer's financial benefit.

**Professional Associates:** Professional associate means any colleague, scientific mentor, or student with whom the peer reviewer is currently conducting research or other significant professional activities or with whom the member has conducted such activities within three years of the date of the review.

**Standing Review Group Membership:** When a scientific review group meets regularly, a relationship among the individual members exists; therefore, the group as a whole may not be objective about evaluating the work of one of its members. In such a case, a member's application or proposal will be reviewed by another qualified review group to insure that a competent and objective review is obtained.

**Longstanding Disagreements:** A conflict of interest may exist where a potential reviewer has had longstanding scientific or personal differences with an applicant.

**Multi-Site Or Multi-Component Project:** An individual serving as either the principal investigator or key personnel on one component of a multi-site or multi-component project has a conflict of interest with all of the applications or proposals from all investigators or key personnel associated with the project. The individual should be considered a professional associate when evaluating applications or proposals submitted by the other participants in the project.

**Request For Applications (RFA) Or Request For Proposals (RFP):** Persons serving as the principal investigator or key personnel on an application submitted in response to an RFA or on a proposal in response to an RFP are generally considered to have a conflict of interest with all of the applications or proposals submitted in response to the RFA or RFP. However, if no other reviewer is available with the expertise necessary to ensure a competent and fair review, a waiver may be granted by the PRC that will permit an individual to review only those applications or proposals with which he/she has no conflict of interest that is likely to affect the integrity of the advice to be provided by the reviewer.

**Appearance Of A Conflict Of Interest** means that a reviewer or close relative or professional associate of the reviewer has a financial or other interest in an application or proposal that is known to the reviewer or the PRC and would cause a reasonable person to question the reviewer's impartiality if he or she were to participate in the review. The PRC will evaluate the appearance of a conflict of interest and determine whether or not the interest would likely bias the reviewer's evaluation of the proposal. Where there is an appearance of conflict of interest, but not sufficient grounds for disqualifying the reviewer, the PRC will document: (1) that there is no real conflict of interest; and (2) that, at the time of the review, no practical alternative exists for obtaining the necessary scientific advice from the reviewer with the apparent conflict.

**Waivers** If no other reviewer is available with the expertise necessary to ensure a competent review, a waiver may be granted by the PRC to allow participation in the review.

## **CONFIDENTIALITY AND NON-DISCLOSURE OF MATERIALS AND PROCEEDINGS**

The applications and proposals and associated materials made available to reviewers, as well as the discussions that take place during review meetings are strictly confidential and must not be disclosed to or discussed with any one who has not been officially designated to participate in the review process. In addition, disclosure of procurement information prior to the award of a contract is prohibited by the Procurement Integrity Act.

## **CERTIFICATION**

All reviewers must certify that they have read the Conflict of Interest, Confidentiality, and Non-Disclosure Rules.” The reviewer must certify that, to the best of his/her knowledge, he/she has disclosed all conflicts of interest that he/she may have with the proposal or its authors and he/she fully understands the confidential nature of the review process and agrees: (1) to destroy or return all materials related to it; (2) not to disclose or discuss the materials associated with the review, their evaluation, or the review meeting with any other individual except as authorized by the PRC; (3) not to disclose procurement information prior to the award of a contract; and (4) to refer all inquiries concerning the review to the PRC.

**PRE-REVIEW CERTIFICATION FORM**  
**REGARDING CONFLICT OF INTEREST, CONFIDENTIALITY, AND NON-DISCLOSURE FOR**  
**REVIEWERS OF SCIENCE PROPOSALS**

Name [Last, First]: \_\_\_\_\_  
(Please print)

Address:

Other Employers (if applicable)

Title of Proposal Reviewed: \_\_\_\_\_

\_\_\_\_\_

Date(s) of review: \_\_\_\_\_

**Check only one** (and provide any comments or explanations on reverse side):

I have read the attached "Conflict of Interest, Confidentiality, and Non-Disclosure Rules and Information for Reviewers" and hereby certify that, based on the information provided to me, **I do not have a conflict of interest in the proposal listed above or the proposal authors.**

**OR**

I have read the attached "Conflict of Interest, Confidentiality, and Non-Disclosure Rules and Information for Reviewers" and hereby certify that based on the information provided, **I have a conflict of interest in the specific proposal or proposal authors listed above** and hereby recuse myself from the review of this proposal.

**Certification**

I certify that I have read the attached "Conflict of Interest, Confidentiality, and Non-Disclosure Rules and Information for Reviewers." I certify that to the best of my knowledge I have disclosed all conflicts of interest that I may have with proposals or proposal authors and I fully understand the confidential nature of the review process and agree: (1) to destroy or return all materials related to it; (2) not to disclose or discuss the materials associated with the review, my evaluation, or the review meeting with any other individual except as authorized by the Proposal Review Committee (PRC); (3) not to disclose procurement information prior to the award of a contract; and (4) to refer all inquiries concerning the review to the PRC.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**POST-REVIEW CERTIFICATION FORM**

**REGARDING CONFLICT OF INTEREST, CONFIDENTIALITY, AND NON-DISCLOSURE OF  
INFORMATION FOR REVIEWERS OF SCIENCE PROPOSALS**

**Title of Proposal Reviewed:** \_\_\_\_\_

**Date(s) of review:** \_\_\_\_\_

**A. Confidentiality and Non-Disclosure:** I fully understand the confidential nature of the review process and agree: (1) to destroy or return all materials related to the evaluation; (2) not to disclose or discuss the materials associated with the review, my evaluation, or the review meeting outside of that meeting or with any other individual except as authorized by the Proposal Review Committee (PRC); (3) not to disclose procurement information prior to the award of a contract; and (4) to refer all inquiries concerning the review to the PRC.

**B. Conflict of Interest For Non-Federal Reviewers:** This is to certify that in the review identified above, I did not participate in an evaluation of any application or proposal: (1) from any applicant institution or offeror where I am a full- or part-time salaried employee or where I am negotiating for such employment; (2) from any applicant institution or offeror where I have received or could receive a direct financial benefit in relation to the application or proposal under review or have received or could receive a financial benefit from the applicant institution or offeror or principal investigator valued at \$10,000 or more per year that is unrelated to the application or proposal under review; (3) submitted by a close personal relative, a member of my household, or professional associate, or if such person receives financial benefits from or provides financial benefits to an applicant or offeror. If there was an appearance or real conflict of interest, or (4) any application submitted by my former (within the past year) employer I recused myself from the review of the application/proposal or was granted an appropriate waiver.

**CERTIFICATION**

I fully understand the confidential nature of the review process and agree to confidentiality and non-disclosure (Paragraph A) and certify that in the review above I did not participate in an evaluation of any application or proposal with which I knowingly had a conflict of interest (Paragraph B).

\_\_\_\_\_  
**Printed Name**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date Signed**

## Appendix B

### Technical Review Criteria Used for Individual Peer Reviews of Science Proposals and Instructions to Reviewers

#### Technical Review Criteria:

**Goals.** Are the goals, objectives, and hypotheses clearly stated and internally consistent? Is the idea timely and important? Does the proposal directly address one or more important research questions targeted by the sub-theme under which it was submitted?

**Justification.** Is the study justified relative to existing knowledge? Is the conceptual basis clearly stated in the proposal and does it explain the underlying basis for the proposed work?

**Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are the results likely to add to the base of knowledge? Is the project likely to generate novel information, methodologies, or approaches?

**Feasibility.** Is the approach fully documented and technically feasible? Are the underlying assumptions reasonable? What is the likelihood of success? Are the scale, budget, and timeline of the project consistent with the goals and objectives and within the grasp of the authors?

**Products.** Is the project likely to yield products of value? Are interpretative (or interpretable) outcomes likely from this project? Will the information ultimately be useful to decision makers?

**Capabilities.** What is the track record of the authors in terms of their past work? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have the infrastructure and other aspects of support necessary to accomplish the project?

**Instructions to reviewers:**

Please provide a brief written summary of your review findings for each review criterion. Please provide an overall numerical rating of the proposal based on your review. Please do not report numerical ratings with greater than two significant figures. Use the rating definitions below to determine your overall rating. Please provide a brief written justification for your overall rating.

<b>Rating</b>	<b>Definition</b>
5 – 5.9 (Superior)	All aspects of the proposal are clear and well described. All technical review criteria are affirmatively met and there is a high probability of success. No substantive flaws are noted, although some minor errors or omissions may be noted.
4 – 4.9 (Good)	All aspects of the proposal are clear and well described. A majority of the technical review criteria are affirmatively met, although there may be some minor questions related to some aspects of the proposal. Reviewers may identify one substantive flaw, but there is a clear resolution to that flaw. Some minor errors or omissions also may be noted.
3 – 3.9 (Average)	The proposal is sound overall, but some deficiencies are noted. Reviewers may identify up to two substantive critical flaws, and at least half of the technical review criteria are affirmatively met.
2 – 2.9 (Below Average)	The proposal presents a cogent description of the project but serious deficiencies are noted. Reviewers may identify three or more substantive critical flaws, and less than half of the technical review criteria are affirmatively met.
1 - 1.9 (Inferior)	The proposal does not present a cogent description of the project and serious deficiencies are noted. Reviewers may identify three or more substantive critical flaws, and less than half of the technical review criteria are affirmatively met.

## Appendix C

### Proposal Rating Categories and Considerations Used by the Peer Review Committee

Average Rating	Interpretation	Further Consideration
5 – 5.9	The proposal received top scores from all reviewers, with an average score ranging from 5 to 5.9. No substantive flaws noted, although some minor errors or omissions may be noted.	Yes. All proposals with an average rating $\geq 5$ will be considered in the agency relevancy review.
4 – 4.9	The average score from three reviewer's ranges from 4 to 4.9. Reviewers may identify one substantive flaw, but there is a clear resolution to that flaw. Minor errors or omissions also may be noted.	Yes. All proposals with an average rating $\geq 4$ will be considered in the agency relevancy review. A recommendation to fund a proposal in this category is contingent upon satisfactory revision to address all technical review comments.
3 – 3.9	The average score from three reviewers ranges from 3 to 3.9.. Reviewers may identify up to two substantive critical flaws. Minor errors or omissions also may be noted	Yes/No. Proposals with an average rating $\geq 3$ will be considered in the agency relevancy review. A recommendation to fund a proposal in this category is contingent upon satisfactory revision to address all technical review comments.
2 – 2.9	The average score from three reviewers ranges from 2 to 2.9. Reviewers may identify three or more substantive critical flaws. Minor errors or omissions also may be noted.	No. Proposals with an average score $< 3$ will not receive further consideration.
1 – 1.9	The average score from three reviewers ranges from 1 to 1.9. Reviewers may identify three or more substantive critical flaws. Minor errors or omissions also may be noted.	No. Proposals with an average score $< 2$ will not receive further consideration.