

## PSNERP (the Project) Peer Review

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### INTRODUCTION

*The Nearshore Science Team (NST) of the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) proposes to the PSNERP Management Team, Steering Committee and Executive Committee that the PSNERP formally institute both internal (research and product review) and external (program review) peer review to see the Project through the completion of the General Investigation. Certain aspects of PSNERP governance already receive strict, formalized peer review (e.g., USACE competitive contractor selection) or presently have a reasonable informal peer review process (e.g., Valued Ecosystem Component white paper review). However, the Project's strategic science and overall program structure and direction, especially as developing in the General Investigation, at present has no peer review. This NST statement and proposal addresses all levels of peer review but is particularly focused at the Project's needs at the programmatic level.*

Peer review is a fundamental tenet of good science around the world. Independent peer review is the accepted tool for rigorous, impartial evaluation of scholarly manuscripts, research proposals, complex institutional research programs, faculty promotion and most other decisions affecting how science is conducted and used to address human needs and problems. Peer review has become a cornerstone of most science and engineering research and funding agencies. For instance, the Ecological Society of America (ESA)<sup>1</sup> has described peer review as "...is an integral component of scientific research and publishing. It allows the scientific community to maintain quality control of research through the review of research proposals, journal manuscripts and other reports. Academic peer review, although far from perfect, is the best tool scientists have to ensure high standards for their professional work."

### PEER REVIEW COMPONENTS

Restoration of Puget Sound nearshore ecosystems as developed under PSNERP will involve extensive assessment of scientific direction and priorities, and scrutiny of background science and restoration performance; all of these aspects demand some level and type of peer review. Peer review under PSNERP should: (1) ensure that the "best available science"<sup>2</sup> is pursued; (2) avoid potential conflicts of interest; and, minimize the influence of other, subjective factors, such as funding source. There are four fundamental types of peer review: (1) research proposal ranking and selection; (2) technical report and other product review; (3) strategic science approach review; and (4) program review.

Decisions of Selection or Ranking. Any decision based on scientific and technical merit, such as evaluation of research proposals, should be based in peer review. Through peer review, the difficult decisions about research funding allocation and dissemination of results can be objectively based on scientific validity, originality, and importance.

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<sup>1</sup> Ecological Society of America (ESA) Public Affairs Office briefing to the US Congress, ESA Bulletin 86(1), January 2005; see: <http://www.esapubs.org/bulletin/current/current.htm>

<sup>2</sup> See US federal and other institutional/legal definitions; Lessons Learned document (PSNERP-NST 2005) also provides detailed definition.

Product Review. The second internal need for formalized peer review is to ensure the scientific credibility of PSNERP products, such as guidance documents, technical reports and data/metadata. Optimally, peer review is characterized by:

1. Effectiveness—an effective process for peer review is essential to promote academic integrity
2. Competence—reviewers should have the expertise to provide an authoritative review
3. Usefulness—procedures for reviews will be followed in a timely fashion and that reviewers' comments will be constructive
4. Security—has confidence that the peer review process minimizes the risks of bias and that reviewers will not take unfair advantage of privileged information

Scientific Strategy and Direction. Peer review is also a critically important aspect of program guidance, contributing to pivotal decisions and advising on strategic directions. Such guidance typically involves a body (formal committee or panel) of experts from outside the region, who are completely disassociated with the program but familiar with the ecosystems and scientific concepts required to address the regional issues. Such peer review can serve internal direction in (1) an *advisory* role or can (2) provide *critical review* of program progress and performance. In addition, these roles may be exercised *internally* (operating as an explicit component of the organizational structure) or *externally* (operating outside of the organizational structure, reporting to an over-seeing or independent body).

There are some significant differences in the internal advisory vs. external review roles:

- Internal advisory bodies do not always examine the fine detail aspects of a program, but more the program's fundamental goals and objectives, the strategic approach to addressing them and the organization structure and decision-making process. When applied most effectively, advisors are involved early in the program and meet periodically to review the program at critical stages, in an adaptive mode. Reporting is often brief and often the most critical exchange is verbal review with the program staff. They often report directly to a program's technical staff, but copy their advice to management levels.
- External review bodies typically evaluate a program nearing its completion, or at least late in its maturity. The primary goal is often to assess whether or not the program has met its goals and objectives, and to provide pivotal evaluation for the decision of whether or not to continue a program. Such review panels or committees may stipulate their own approach to assessing the program, independent of the program or its sponsor.

Programmatic Structure. Designing the structure of a complex restoration program, such as the PSNERP General Investigation, is a difficult task with seemingly endless alternatives to integrating and balancing science, management, governance and evaluation (VanCleve *et al.* 2004). Peer review, often associated with comparable tasks under Scientific Strategy and Direction (above), can also be utilized to help advise on and shape program structure to maximize the implementation of "best science".

### **NST PROPOSAL FOR PSNERP PEER REVIEW**

**The integrity and effectiveness of scientific investigations associated with PSNERP require peer review, preferably in the multiple programmatic levels described above. The NST recommends that PSNERP establish peer review at three levels, with particular emphasis on Program Review:**

#### **1. Proposal and Product Review (Internal)**

## 2. Strategic Science Review (Internal)

### 3. Program Review (External)

*Research Proposal and Product Review* would provide the periodic review required for proposals and products from and to PSNER. These would be based on an internal review process conducted by anonymous, independent experts not associated with the program. To prevent real or perceived conflict of interest, reviewers would be limited to individuals not related to any on-going PSNER research or other direct or contractual activities. The reviewers and their disciplines would vary depending upon the topic of the review, but their expertise should overlap extensively with the proposal or product topic. Review of PSNER products (e.g., reports, manuscripts, datasets) would typically be based on mail/e-mail exchanges. Proposal reviews would likely involve a combination of mail/e-mail review and panel meetings. Review participants would be volunteers (as is often the case for proposal and manuscript review) or be compensated on a review-by-review basis.

*Strategic Science Review* would involve a standing panel or committee of nationally-recognized technical experts that would be incorporated at the early stages of the PSNER. These experts would provide scientific guidance and oversight of the overall program, particularly at critical stages in formulation and implementation of science initiatives. Preferably, the composition would be multidisciplinary, including at least the following scientific disciplines: coastal physical oceanography or wetland hydrology; geomorphology or sedimentology; coastal systems ecology; restoration engineering; fish and wildlife ecology; information management; and socioeconomics. Members would be drawn from both the region and the nation as available; as in the other peer review, strict conflict of interest rules would also apply to Strategic Science Review panelists. They would meet periodically (e.g., at least twice per year) to review both status of the PSNER science (e.g., *vis a vis* a PSNER “all-scientists” meeting) but also at important junctures in evolution of the Science Plan. The panel would interact principally with the PSNER technical staff and participants but report their assessments and recommendations directly to the PSNER steering and management levels. Participants would be compensated on an on-going contractual basis.

*Program Review* would require a less frequent (e.g., annual?) assessment than the *Strategic Science Review* but would address the broader goals and purposes of the PSNER on the scale of a NRC review but with continued involvement rather than a one-time review. It would be composed of both national (or international?) and regional experts, including representatives of scientific and technical expertise, social scientists and stakeholders. Optimally, members would have some experience in large, ecosystem-scale restoration in other regions (as might be represented by key individuals involved in the case study programs reviewed in Van Cleve *et al.* 2003). While their background should be science based, their perspective should be programmatic, e.g., to ensure that science is most effectively deployed and managed toward the goals of the PSNER. They would report principally to the PSNERP Executive Committee.. Participants would be compensated on an on-going contractual basis for each review period.

## REFERENCES

- Van Cleve, F. B., C. Simenstad, F. Goetz and T. Mumford. 2004. Application of the “best available science” in ecosystem restoration: lessons learned from large-scale restoration project efforts in the US. Tech. Rep. 2004-01, Puget Sound Nearshore Partnership, Olympia, WA. 34 pp.

