

The Puget Sound Partnership's Guidelines for Scientific Review

Prepared by Nathalie Hamel and Ken Currens
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It is the intent of the Puget Sound Partnership that the scientific and technical work it produces and disseminates, as well as the results from applying adaptive management strategies and tools to inform recovery efforts, undergo scientific review. The purpose of the following guidelines is to help the Puget Sound Partnership and its partners ensure that the work informing Puget Sound recovery efforts is appropriately reviewed.

Introduction

The role of the Puget Sound Partnership (Partnership) is to coordinate and lead the efforts to restore the health of Puget Sound. The Partnership uses many kinds of information, including those from performance management reports, public opinion, policy analyses, and scientific documents and tools. The Strategic Science Program at the Partnership incorporates, synthesizes, and communicates scientific information for decision-making. The objectives of the Science Program include identifying and assessing the benefits of, and pressures on, the Puget Sound ecosystem; identifying and monitoring indicators of ecosystem status and human health and wellbeing; studying ecological, physical, and social mechanisms to help improve tools for restoration and protection; evaluating the effectiveness and trade-offs of strategies to recover Puget Sound; and communicating these results to further scientific understanding and improve decisions. Scientific review is a key tool that allows the Partnership to improve the quality, credibility, objectivity, certainty and applicability of the scientific and technical information incorporated in decision-making processes.

The objectives of these guidelines are to exemplify the kinds of work that should be reviewed; describe the different forms of scientific review; provide general guidance on how to choose appropriate forms of scientific review; and finally to identify who is responsible for managing scientific reviews. The guidelines in this document build on the peer review guidelines in the *Strategic Science Plan 2010*. These guidelines do not provide detailed instructions on specific assessment factors or how to facilitate scientific reviews because these are well described in other publications (e.g., EPA Science Policy Council 2003, OMB 2004, EPA Science Policy Council 2006).

What Should Be Reviewed?

The scientific and technical works produced and disseminated by the Partnership vary in scope, scale, objectives, and influence. Consequently, scientific reviews at the Partnership go beyond the review of

documents, technical reports, and scientific journal articles. Furthermore, scientific reviews are not restricted solely to the penultimate version of products but can also occur during their development.

By “scientific and technical work”, these guidelines generally mean information that the Partnership generates and disseminates that:

- Contains or uses environmental, social and economic data, theories, or hypotheses;
- Asserts scientific and technical conclusions that could influence decisions or positions taken by the Partnership;
- Contributes new scientific knowledge;
- Enhances professional development and credibility of the staff.

Examples of work, tools and approaches subject to scientific review include, but are not limited to: journal articles; technical reports; syntheses of scientific work and recommendations; models; analytical methods; assumptions; risk assessments; research and monitoring frameworks, plans, and proposals; scientific protocols for data collection, analysis, and quality control; requests for proposals for scientific work; decision-support and adaptive management tools; recovery strategies; choice of ecosystem components, indicators and targets; and technical fact sheets, summaries, and briefing sheets.

What is Scientific Review?

For the Partnership’s purposes, scientific review is the validation of scientific and technical information, methods, models, and strategies for adaptive management based on the judgments of scientific and technical experts in relevant subject areas by evaluating defined criteria including the soundness of the methods, applicability and utility, clarity and completeness, and treatment of variability and uncertainty of data and information (EPA Science Policy Council 2003).

Forms of Scientific Review

These guidelines prescribe different forms of scientific reviews commensurate with the different types of products, tools and approaches (OMB 2004). For the Partnership’s purposes, scientific review can take on three main forms:

- External peer review
- Internal peer review
- Expert comment

External peer review

External peer review is characterized by the judgments of experts who can provide perspectives independent of the authors’; who have no conflict of interest with the work or outcome of the review; and who represent a balance of different perspectives if the issue or work is controversial. Individual reviewers may be affiliated with a variety of institutions and organizations in Washington, other states, or nations, but all reviewers are expected to provide independent and non-representational evaluations of the work. The peer review process, referees, and findings are well documented. External peer review provides the greatest potential for transparent, independent, and rigorous scrutiny. This form of review is designed to increase the scientific community’s and public’s

confidence in the science underlying decision-making.

Examples of work that should be considered for external peer review include contributions to the *Puget Sound Science Update*; the science and technical work underlying influential decisions (EPA Science Policy Council 2006) or high-level strategy documents, such as the *Action Agenda*; the *Strategic Science Plan*; analyses, assumptions and models that inform key decisions that affect the scope and success of recovery actions across the Puget Sound; and new or innovative scientific work that could be published to contribute to the scientific understanding supporting ecosystem protection and restoration.

Although external peer review offers the highest degree of transparency and rigor relative to the other two forms of review, it is usually more time-consuming and can be more expensive. For instance, some of the time-consuming steps include enlisting experts willing to donate time to review, reviewing the work, and allowing authors time to respond to comments and improve their product. The Partnership encourages scientific work to be submitted as manuscripts for publication to scientific journals because it benefits from peer review processes already in place and contributes to scientific understanding. However, this process can take months to complete. Consequently, the logistics and timing of external peer review need to be built in the overall planning.

Internal peer review

The key distinction between external and internal peer review is whether reviewers are affiliated with the Partnership. Otherwise, the process is managed similarly to external peer review. By statute, the Partnership is composed of the executive director and his or her staffs, the Leadership Council, an Ecosystem Coordination Board, and a Science Panel. Consequently, if the Science Panel directly reviews a product (as opposed to the Science Panel facilitating an external peer review), the review is considered internal. This is consistent with the enabling legislation for the Partnership that created the Science Panel as an official part of the agency (RCW 90.71.210) but that also directed the Science Panel to provide independent and non-representational advice (RCW 90.71.270). In all cases, internal peer review is still expected to meet the same standards of quality as external peer review.

Considerations for conducting an internal peer review involve balancing the need for rapid and inexpensive yet rigorous review, and the need for public confidence in the product. Internal peer review can usually be completed more quickly and with fewer resources than external peer review. However, the perception created by the affiliation of internal peer reviewers with their organization may not provide the same degree of public confidence as external peer review. Examples of products that would be appropriate for internal peer review include short-term strategy-setting documents, such as analyses of ecological indicators or targets; reports or documents synthesizing existing work; findings that arise from the use of adaptive management tools that integrate science into decision-making, such as the *Dashboard of Ecosystem Indicators*, the *State of the Sound*, and the *Biennial Science Work Plan*; or reports on new scientific findings that have limited scope or applicability or that have the potential to be expanded to contribute more broadly. Internal peer review can also be an important initial review for products that are ultimately to receive external peer review. When public comment and review of these products also occurs, it can provide valuable information about whether

public confidence in the credibility and appropriateness of the science calls for a more rigorous external peer review.

Expert comment

Expert comment, also known as “peer input” (OMB 2004), is the practice of soliciting informal review and critique from qualified coworkers and colleagues familiar with a topic. It is widely used in the scientific community during all phases of scientific work, including study design, analysis, and document preparation, particularly at the drafting stage. Three key distinctions between expert comment and external or internal peer review are that 1) expert reviewers may not necessarily be as independent from the work as external reviewers; 2) the reviews often target one or just a few of the assessment factors that peer reviews do (e.g., soundness, applicability, clarity and completeness, variability and uncertainty, and validity of information) and 3) findings of the reviews may not be documented or available publicly. Transmission of expert comments is also usually informal and may not be written for a public audience. Consequently, expert comment is valuable for ensuring the quality of the scientific information, but it is not a substitute for external or internal peer review.

Examples of documents and work that are subject to expert comment include fact sheets; briefing materials that draw from peer reviewed documents; information summaries; scientific website-content; assumptions and methods as part of science-based assessments; and drafts of journal articles.

Anonymity and Confidentiality

Scientific reviews are generally anonymous (meaning, the identity of reviewers is not disclosed to the authors or the public). It is common scientific practice for the referees who manage the review to be the only people who know the identity of reviewers. Anonymity helps protect the reviewers’ ability to be independent and critically constructive. The Partnership believes that protecting the reviewers’ independence is important. However, transparency is also important in public processes.

Consequently, referees for Partnership reviews (e.g., the Partnership’s Science Panel, Puget Sound Institute, professional organizations like the Washington State Academy of Sciences, or the Partnership’s Science Director) may on occasion choose to release the names and affiliations of peer reviewers, but to the extent possible specific comments will not be tied to individual reviewers (EPA Science Policy Council 2006). Whatever the case may be, authors will be informed prior to accepting or doing the review about how anonymity and confidentiality will be managed. This guidance on anonymity and confidentiality should be included in the instructions to authors.

Scientific Review and Public Comment

Scientific review should not be confused with public comment or other stakeholder processes (OMB 2004). Scientific review and public comment are two different means of obtaining feedback used by the Partnership. The public comment process is transparent and open to anyone, regardless of the interests, affiliation, or expertise of commenters. The information provided by various stakeholders does not necessarily provide a rigorous and scientific review of the work. It can, however, provide information about errors of facts; identify other sources of information; provide perspectives on utility; or highlight valuable information about public confidence in the credibility and

appropriateness of the science supporting the work. This can point to the need for improvements or more rigorous external peer review. Therefore, scientific review and public comments are not interchangeable but rather are complementary forms of review.

Who Manages Scientific Reviews?

The Puget Sound Partnership Science Panel has broad oversight over scientific review (RCW 90.71.270-280). Because scientific reviews can take a variety of forms, the choice of what form of review to use and how to manage the process needs to be decided on a case-by-case basis. For instance, reviewers may represent one scientific discipline or a variety of disciplines; the number of reviewers can range from a few to more than a dozen; the names of each reviewer may be disclosed publicly or remain anonymous; the reviewers may be blinded to the authors of the report or the reviewers may know the names of the authors; the reviewers may prepare individual reports or a panel of reviewers may produce a collaborative report; panel members may work remotely or they may meet together in person to discuss and prepare their evaluations; and reviewers may be compensated for their work or they may donate their time as a contribution to science or public service (OMB 2004).

It is the responsibility of all Partnership staff working with technical or scientific information to understand the expectations for scientific review and how to ensure that the process is conducted appropriately. Staff and partner scientists in consultation with the Science Director at the Partnership are responsible for using their professional judgment to anticipate and plan the appropriate level of review. Within Washington, the Washington State Academy of Sciences, the Puget Sound Institute at the University of Washington-Tacoma, and the Puget Sound Partnership Science Panel are among the groups that can facilitate credible external peer review. When there is doubt, the Science Panel should be consulted and make the final decision.

Partnership staff and managers considering whether scientific review of a product is needed or what kind of review to pursue should consider the following questions:

- What is the nature and scope of the work (e.g., is it a journal article, a high-level strategic document, a plan, an assessment or analysis, a fact sheet, etc.)?
- What is the purpose of the review? When in the development of the product is the information from a review most needed?
- How influential is the information potentially going to be on policy and management decisions? What are the potential consequences of the decisions? What level of scrutiny is likely to occur?
- Is this an innovative and substantial advance that contributes new scientific knowledge or understanding?
- How much does the credibility of the work depend on the perceived independence or lack thereof from the reviewers?
- How much time and resources are needed to accomplish the intent of the review?

Agencies and tribes that work with the Partnership (e.g., U.S. Geological Survey, National Oceanic and Atmospheric Administration, Washington Department of Ecology, Washington Department of Fish and Wildlife, and many others) often conduct scientific reviews of their work following similar scientific guidelines. Where possible, the Partnership will collaborate with the agencies and tribes to ensure the scientific reviews are not redundant with those of others and are mutually beneficial. Where data, models, or other scientific products provided to the Partnership by agencies or tribes are reanalyzed or adapted for different purposes, additional external review may be needed.

References

EPA Science Policy Council. 2003. A summary of general assessment factors for evaluating the quality of scientific and technical information. EPA 100/B-03/001. Washington, DC.

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OMB. 2004. Final Information Quality Bulletin for Peer Review. Washington DC.