Peer Review, Publication, and Administrative Recordkeeping Requirements for Scholarly and Science Information Disseminated by the NPS Inventory and Monitoring Division

This document serves as guidance to National Park Service Inventory and Monitoring Division (IMD or the "Division") staff in the implementation of guidance for conducting peer reviews issued by the National Park Service (NPS; 2008). Although NPS science integrity policies mandate that all employees have a role in ensuring that scientific and scholarly work is appropriately *reviewed*, the IMD Chief and other staff as delegated by the IMD Chief, are responsible for ensuring that the information released by the program meet scientific and professional standards.

As per NPS (2008), this guidance applies to all scientific and scholarly information used in decision-making, regulatory processes, or dissemination to the public and regardless of media (i.e., print, digital, audiovisual, or web). Because OMB defines dissemination as all "agency-initiated or sponsored distribution of information to the public," the peer review, publication, and administrative recordkeeping requirements described herein apply regardless of whether products are published in official IMD-managed report series, other venues, or are released in "unpublished" format.

This guidance prescribes the all roles, functions, and process for both the review and release of scientific and scholarly products developed by the Division, disseminated by IMD staff, or collected using Inventory & Monitoring (I&M) Program funding. **Program Managers (at all levels) are responsible for ensuring that any scientific and scholarly information produced, used, or released by their program meet all applicable scientific integrity, administrative, and policy standards. As per NPS policies, it is the responsibility of the peer review manager to determine the appropriate level and type of review based on a combination of the information type, expected information influence level (as defined by OMB) and venue for dissemination or distribution.**

Although peer review generally benefits all scientific and scholarly activities, existing workloads do not permit conducting the same intensity of peer review for all types of scientific and scholarly information products developed by the Division. As a result, regional and network program managers must apply professional judgment to each scientific or scholarly information product to determine the type and level of peer review that is necessary at any step in the implementation process. It is not acceptable to publicly release products in "unpublished" form (internally or externally) to avoid peer review requirements of a scientific and scholarly product.

The rationale for establishing a peer review process for IMD products is, first and foremost, to ensure the scientific merit and credibility of inventory and monitoring data collected by the Division. Furthermore,

current NPS peer review guidance requires that NPS scientific and scholarly activities comply with OMB Final Information Quality Bulletin for Peer Review (2004; 70 FR 2664-2677), and NPS Director's Order (DO) #11B: Ensuring Quality of Information Disseminated by the National Park Service.

Peer review is a collaborative and necessary quality-control process in which the scientific merit of scientific information is critically evaluated by independent peers, meaning persons who are not associated directly or indirectly in the development of the information under review, and whose background and expertise puts them on par technically and scientifically with the authors of the information.

This document only applies to products considered to be "Scholarly or Scientific Information" as defined by OMB (2004); see below). It does not address the process for peer review of information products that the NPS determines to be either "influential scientific information" and/or a "highly-influential scientific assessment." Scientific and scholarly work of this nature requires a separate more-specific peer review, determined in conjunction with the regional NPS Chief Scientist (or others as determined by the regions). Although the peer review process for such documents is not described herein, the roles of IMD staff in determining whether documents require such review, and the administrative requirements for such products *are* discussed.

Definitions

General Terms (from NPS 2008)

Dissemination. NPS initiated or sponsored distribution of information to the public. Dissemination does not include distribution limited to government employees or NPS contractors or grantees; intra- or inter-agency use or sharing of government information; and responses to requests for agency records under the Freedom of Information Act, the Privacy Act, the Federal Advisory Committee Act, or other similar law. This definition also does not include distribution limited to correspondence with individuals or persons, press releases, archival records, public filings, subpoenas or adjudicative processes.

Scientific or Scholarly Activities. Activities involving inventorying, monitoring, experimentation, study, research, modeling, and scientific assessment. Scientific or scholarly activities are conducted in a manner specified by standard protocols and procedures and include any of the physical, biological, cultural, or social sciences as well as landscape architecture, engineering, and mathematics that employ scientific or scholarship methods. Inspections for regulatory compliance and resulting records are not included, even though they may require use of complementary methods.

Information Types (from NPS 2008; OMB 2004)

Information. Any communication or representation of knowledge (e.g., fact or data), in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. This definition includes information that an office disseminates from a web page, but does not include the provision of hyperlinks to information that others disseminate. This definition does not include opinions, where the office's presentation makes it clear that what is being offered in someone's opinion rather than fact or the office's views.

Scientific or Scholarly Information. Scientific and scholarship outputs that consist of proposals, hypotheses, models, written documents, records of all kinds, and assessments. This definition does

not include opinions, where the presentation of an output makes clear that what is being offered is someone's opinion rather than fact or the agency's views. Scientific or scholarly information includes all of the following:

- Factual inputs, data, models, analyses, technical information, or scientific or scholarly assessments based on the behavioral, cultural, and social sciences, health and medical sciences, life and earth sciences, engineering, or physical sciences.
- Any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms.
- Information that an agency disseminates from a web page, but does not include the provision of hyperlinks to information that others disseminate.

Scientific or Scholarly Assessment. Scientific or scholarly information constructed to provide an evaluation of a body of scientific or technical knowledge, typically by synthesizing multiple factual inputs, data, models, assumptions, and/or by applying best professional judgment to bridge uncertainties in the available information.

Information Influence Level (from OMB 2004)

Informative Scientific or Scholarly Information. Scientific or scholarly information that serves to inform scientific, scholarly, and management awareness and decision-making generally but that does not provide the sole or major component of information used in decision-making and does not, by itself, lead to a change in the direction of decision-making or to a decision that creates a clear and substantial impact on important public policies or private sector decisions.

Influential Scientific or Scholarly Information. Scientific or scholarly information that the Service reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions but that does not meet the definition of "highly-influential scientific assessment." Influential scientific information is a subset of "informative scientific information." Information is influential in determining important policies or decisions if the same decision would be difficult to reach in the absence of the information. Information has a clear and substantial impact when the specific information serves as the principal basis for a decision that affects significant numbers of private sector entities outside parks or not associated with NPS assistance activities.

Highly-Influential Scientific or Scholarly Assessment. A scientific or scholarly assessment that could have a potential impact of more than $500 million in any year, or is novel, controversial, or precedent-setting or has significant interagency interest. Such an assessment is a subset of "influential scientific or scholarly information."

Types of Review

For the purposes of this document, peer review refers to scientific peer review, defined as the evaluation of scientific proposals, programs, publications, and other products by qualified scientific or technical experts.

Internal peer review. is a type of review conducted by individuals within the NPS who: 1) have relevant scientific expertise but 2) are not involved in the work product being evaluated. In contrast,

External peer review. is a review conducted by independent experts from outside NPS (i.e., non-NPS employees).

Blind Review. In either internal or external reviews, a blind review occurs when the identity of the reviewers is not made known to the authors until after recommended revisions are completed. A blind review can be single (either the author or reviewer is anonymous) or double (both the author and reviewer are anonymous).

Panel Review. Although not frequently used, panel reviews may desirable when it is necessary to provide consistent background information to reviewers or when consensus on controversial or non-standard methods is required.

Administrative Review. The scientific and scholarly peer review process outlined here does not eliminate the need for administrative review of scientific and scholarly activities by managers. Scientific and scholarly information may also be subject to **management review** to ensure that statements and recommendations are consistent with management policies, planning documents, regulations, and park purposes, programs, and needs. Most products also undergo **editorial review** to ensure compliance with NPS style, branding, formatting, and other policy requirements not related to scientific integrity. Although administrative reviews should be conducted on all information products, neither management nor editorial review is discussed in this document.

Levels of Peer Review

Products developed by IMD must undergo one of four levels (outlined below) of peer review based on: 1) whether the information is based on and collected or analyzed according to a peer-reviewed and approved monitoring protocol, 2) whether the information has been previously peer reviewed and published, or widely accepted and being used by other state or federal agencies, and 3) the complexity, novelty, or potential impact of the information being collected.

No Peer Review Required. This applies to any product that has already been peer reviewed and published, and to reports limited to communicating results from routine statistical analyses based on data collection and analysis methods based on well-established, peer-reviewed protocols. Peer review is not necessary for resource briefs or other derivative / interpretive products that are based on other foundational products that have already undergone appropriate peer review provided that no additional findings or interpretations of data are presented. Note that these products may still require management review.

Limited Independent Review. This level of review applies to protocols and procedures that have: 1) been adapted from works already peer reviewed and published by other agencies, institutions, or units within NPS, and 2) are recognized as standards for use and implementation to meet similar programmatic objectives. *Limited independent reviews specifically evaluate modifications that have been made to a protocol or procedure for use by the I&M Program.* Modifications may include expanded scale (as in implementation of a protocol in a new location), slight changes in protocol objectives, alterations in plot design, changes in sample size, changes in equipment, network-specific data management and certification procedures, etc.

In such cases the purpose of limited independent reviews is to ensure that any modifications to published work do not significantly impact a) the quality of information being collected, b) the ability to analyze those data following planned methods, or c) the likelihood of meeting monitoring or project objectives. The reviews are conducted by experienced professionals (NPS or otherwise) having direct experience with the subject matter or protocol being implemented.

Full Independent Review. This review is the highest level of peer review for scientific and scholarly reports, plans, and procedural documents whose content is not appropriate for a limited independent review. These peer reviews will address, at a minimum, the criteria outlined in the Review Criteria below as well as any additional criteria required by the venue in which the product is intended to be published. Full independent reviews should be conducted by individuals with the appropriate subject matter expertise who were not involved with the development of the product or interpretation of findings.

High-Influence Review. This review pertains to information deemed "influential" or "highly influential." This type of review is not conducted by IMD staff if/when the peer review manager determines that such a review is necessary. However, prior to submission to high-influence review it is recommended that all products receive a full independent review and management review prior to undergoing high-influence review.

Peer Review Process

Typically the peer review process is initiated by the author or project manager when he or she, upon completion of a draft scientific or scholarly information product, sends the manuscript to a peer review manager who is responsible for initiating a formal peer review process prior to its submission to the series manager and program manager for publication and release (Figure 1). Note that the following procedures apply to publication and release of information through NPS report series or other NPS venues and may need to be modified when releasing information through third parties (i.e., other agencies, journals, etc.).

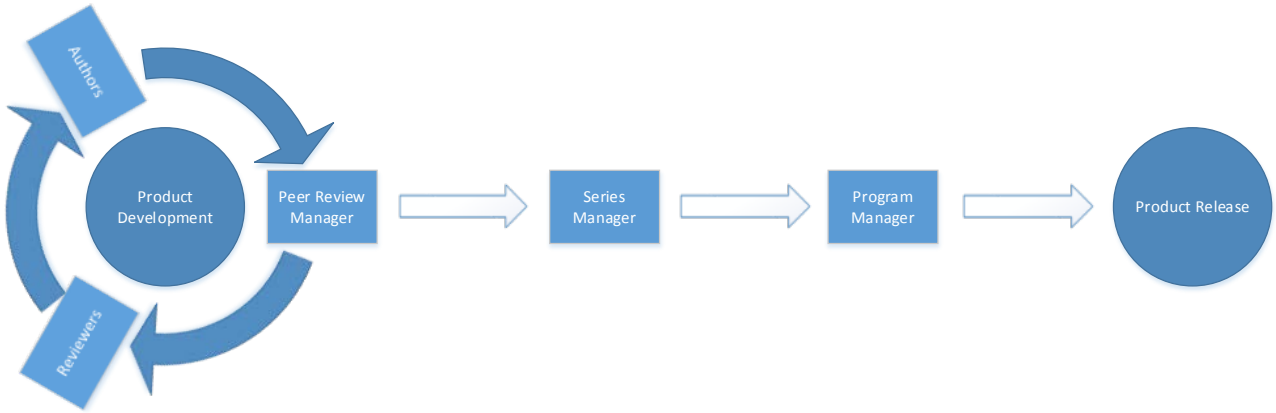


Figure 1. Generalized process for peer review of science information products published by the Inventory and Monitoring Division.

Roles and Responsibilities

Individuals may serve in multiple roles during the development and publication of IMD products such as "program manager-authors," or "peer review manager-program managers." However, Reviewers and Peer Review Managers cannot be individuals who contributed significantly to the development of a particular product (e.g., authors or individuals who provided significant input to study design or interpretation of results), which would compromise the integrity of the peer review process.

Program Manager. Program managers are those management-designated staff who are responsible for the quality of work produced by their organizational unit and have the delegated authority to publish IMD science products (or have authority to submit those products on behalf of NPS IMD for publication via independent outlets such as journals). For purposes of peer review of IMD products, Program Managers are Network or Regional program managers, the IMD Chief, IMD Deputy Chiefs, National Data Manager, and National Inventory Program Managers. All Program managers are responsible for:

- Suggesting (to the peer review manager) the level of peer review and scrutiny warranted given the expected impact and sensitivity of the data being collected, and other factors as appropriate.
- Identifying an alternate independent peer review manager in cases where the program manager's supervisor cannot serve as a peer review manager.
- Suggesting potential reviewers to the peer review manager (this can be in addition to those suggested by product authors).
- Determining the efficacy of the review (i.e., insuring the review was thorough and professional enough).
- Ensures authors address reviewer comments adequately and fairly.
- Approving the product for publication following the recommendation to publish from the peer review manager (if it is to be published in an IMD-managed report series), or returning it to the authors for revisions if not approved.
- Approving IMD products for submission to an external outlet for review and publication (if *not* an NPS-published product)[1].
- Ensuring proper attribution of contributions among contributors (including authorship and acknowledgements).
- Determining any other reviews necessary prior to publication including administrative, management, and editorial reviews.

Project Managers and Product Authors. Typically IMD science products originate from two sources—either they are produced directly by IMD staff, or they are developed as project deliverables through

[1] IMD staff should consult their supervisors to determine the policies that govern cases where IMD personnel are publishing scientific and scholarly material not related to IMD.

contracts, interagency agreements, or cooperative agreements. Report authors and project managers are responsible for ensuring that all products developed during the project life cycle (not just the resultant products) receive appropriate peer review. This includes study plans, statements of work, vendor/cooperator selection criteria, proposals for work to be done, and all interim deliverables. In addition, report authors and project managers are responsible for:

- Determining the appropriate report series or outlet for publication and ensuring that product or report content is consistent with report series guidelines,
- Ensuring that products are complete and suitable for review,
- Identifying and communicating to the program manager any findings or issues that may warrant a higher level of review than generally expected,
- Recommending potential peer reviewers with the appropriate technical and subject matter expertise, and,
- Ensuring that the reports are properly formatted and meet the series guidelines.

Peer Review Manager. The peer review manager is responsible for determining the level and type of peer review necessary, and overseeing the peer review process for any product requiring limited or full independent review.

Peer review manager duties:

- Ensuring that all report series requirements are met for reports to be published in IMD-managed report series.
- Ensuring that the appropriate level of review is conducted, including recommending changes to the level of peer review based on initial review and upon receipt of reviewers' comments (such as determining that the product warrants high-influence review).
- Communicating with peer reviewers by providing:
    - document (s) to be reviewed
    - criteria for conducting reviews including a review template with established relevant questions, and
    - a timeline for completing the review.

  Templates for routine communications with reviewers are located in Appendix A and on the IMD Science SharePoint at: http://inpniscvsp05:39904/im/science/Policy%20Development/Forms/AllItems.aspx?RootFolder=%2Fim%2Fscience%2FPolicy%20Development%2FGuidance%20on%20Peer%20Review%2C%20Publication%2C%20and%20Associated%20Records.
- Responding to questions that the reviewer may have.

- Ensures that products undergoing review contain the appropriate language on ***each page of the document*** as required by OMB:

  THIS INFORMATION IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PRE-DISSEMINATION PEER REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE NATIONAL PARK SERVICE. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

- Preparing a peer review summary of reviewers' comments and responses to any evaluation criteria that need to be addressed by product authors; providing this *peer review report* to the project author(s) for response.

- Creating or maintaining administrative records for the review process and providing requisite records to the program manager who publishes the report/product.

- Documenting that peer review requirements have been satisfied, and formally:

  - recommending the product for publication,

  - recommending the product for publication with revisions, or

  - recommending the product not be published based on peer review comments.

Reviewers. Reviews should be conducted by credible scientific peers; internal or external to NPS, depending upon the product (then we need to define which get internal vs external vs either). Those asked to serve as peer reviewers should have expertise in the research area and should be in a position to independently and objectively comment on the merit of the work. To be independent and objective, reviewers must not be involved in, or have any vested interest in the science information product under review, nor should they be employees or supervisors of any product authors or contributors. Although they may choose to remain anonymous, reviewers will be encouraged to sign their reviews. Responsibilities of reviewers include:

- Providing constructive, objective, and professionally-valid peer review of materials, free of any personal or professional bias, disputes, competition, non-scientific disagreement, or conflict of interest resulting from financial interests or personal or business relationships,

- Submitting recommended revisions and any necessary supporting information to assist with product revisions,

- Not disseminating materials under review to others, and

- Communicating the desire to provide review comments anonymously, if so desired.

Report Series Managers (only for NPS Report Series). Each NPS report series has a dedicated report series manager, whose responsibility is to ensure consistency within the series, as well as compliance with publication policies. Report Series Manager responsibilities include:

- Updating and communicating to program managers the criteria of (and changes to) series-specific peer review requirements,
- Ensuring that the content and scope of material to be published is appropriate and consistent with report series guidance,
- Ensuring products are formatted in accordance with series guidelines and NPS policies,
- Providing appropriate and current NPS- and IMD-specific policy language for inclusion in cover material or metadata,
- Creating the draft record in IRMA Data Store, and
- Assigning requisite report numbers.

Review Criteria

In general, all scientific and scholarly information products should be evaluated against three categories of criteria: the purpose/intent of the information, the methods used to collect and analyze the information, and how results are presented and interpreted in both a scientific and management context. Specific review criteria are typically outlined for report series/types (such as requirements in standards for publishing protocols), but additional criteria may be used at the discretion of the peer review manager in consultation with the program manager, and may be tailored to the reviewers' expertise.

A general peer review form template has been created for use when soliciting peer reviews that should be modified as appropriate: http://inpniscvsp05:39904/im/science/Policy%20Development/Forms/AllItems.aspx?RootFolder=%2Fim%2Fscience%2FPolicy%20Development%2FGuidance%20on%20Peer%20Review%2C%20Publication%2C%20and%20Associated%20Records).

Series-specific peer review forms are located with series-specific guidance on the IMD Science SharePoint at: http://inpniscvsp05:39904/im/science/Policy%20Development/Forms/AllItems.aspx?RootFolder=%2Fim%2Fscience%2FPolicy%20Development%2FReport%20Series%20Guidance

Example criteria include:

Overview and Purpose of Product

- Is the information well-written, logical, and understandable?
- Is the purpose for collecting the information clearly presented, appropriate, and valid?
- Is the specific scientific, scholarly, or procedural reason for conducting the study or implementing the protocol well defined?

Objectives, Methods, Analysis, and Results

- Does the product include an appropriate literature review that puts the work in the context of and properly attributes previous work?
- Are the project objectives specific (attribute or species defined), measurable, and achievable, and do they support the purpose as stated in the introductory material?
- Is the location or spatial bounds of the project specified?
- Are appropriate field, laboratory, library, and sampling methods used for data collection, analysis, and characterization of uncertainty, and are they sufficiently described to allow for replication?
- Are the field, laboratory, library, and statistical methods used suitable and of appropriate design to ensure objectives can be met?
- Are the statistical techniques, sample sizes, and interpretation of analyses appropriate? Were they correctly applied?
- Is the information or data presented sufficient to address the stated objectives? Are there logistical constraints, unacceptable levels of variation, or uncertainties that compromise the analysis and results or the ability to address the stated objectives?

Discussion and Utility of Results or Findings

- Are the findings and conclusions drawn from analysis relevant to the purpose of the report or product?
- Does this body of work, to the extent possible and practical, differentiate among facts, opinions, hypotheses, and professional judgment in reporting the results of scientific and scholarly activities?
- What are the strengths, limitations, relevance, or potential utility for park managers and others of the findings?
- Are conclusions or recommendations supported by findings?

Administrative Recordkeeping

NPS staff are required to maintain records of the review process. Peer review records are produced by multiple individuals during the review and publication process, but the program manager has the responsibility to ensure that all appropriate records for any products released by his/her program are retained his/her program in accordance with NPS records management policies (DO #11D; Table 1). Documentation must be sufficient for an uninvolved person to understand the process used, comments received, and any changes made as a result of the peer review process.

Table 1. Minimum administrative recordkeeping requirements for science information products produced by the NPS Inventory and Monitoring Division based on the level of peer review conducted.

Level of Review	Allowable Influence Levels	Administrative Record Requirements
No Peer Review	Scholarly and Scientific	A peer-reviewed and published protocol or procedural document, cited appropriately as per product series guidelines
Limited Independent Review	Scholarly and Scientific	Documentation of reviewers (name, title, address, position, qualifications) Copy of draft submitted for review Written determination by the peer review manager that the information contained within the final product does not require full independent review. and/or changes required to ensure that level of review is appropriate Documentation of changes made to the final document in response to reviewers' comments with appropriate justifications Copy of draft upon which determination is made
Full Independent Review	Scholarly and Scientific	Documentation of reviewers (name, title, address, position, qualifications) Copies of draft product provided to reviewers Copies of review criteria provided to reviewers Copies of reviewers' comments anonymized as appropriate Written summary of independent reviewers' findings that addressed specific predefined evaluation criteria and additional comments made by peer reviewers that need to be addressed by product authors Documentation of changes made to the final document in response to reviewers' comments with appropriate justifications Copy of draft product recommended for publication by peer review manager
High-Influence Review	Influential Scholarly and Scientific Highly-influential Scholarly and Scientific	Retain all administrative records for reviews conducted prior to submittal to high-influence review. There are additional requirements as defined by OMB, DOI, and NPS policies. Contact your regional NPS Chief Scientist (or others as determined by the regions) for specific information

Related Materials

National Park Service (NPS). 2002. Director's Order #11B: Ensuring quality of information disseminated by the National Park Service.

National Park Service (NPS). 2008. Interim Guidance Document Governing Code of Conduct, Peer Review, and Information Quality Correction for National Park Service Cultural and Natural Resource Disciplines.

National Park Service (NPS). 2008. Proposed update to Director's Order #11B: Information Quality – Ensuring objectivity, utility, and integrity of information used and disseminated by the National Park Service.

National Park Service (NPS). 2012. Director's Order #11D: Records and electronic information management.

Oakley, K.L., L.P. Thomas, and S.G. Fancy. 2003. Guidelines for long-term monitoring protocols. Wildlife Society Bulletin 31(4):1000-1003.

Office of Management and Budget (OMB). 2004. Final Information Quality Bulletin for Peer Review (70 FR 2664-2677).