

Standard Operating Procedure #10: Reporting

Version 1.2 (2021)

In Water Quality Monitoring Protocol for Inland Lakes: Great Lakes Inventory and Monitoring Network

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Revision History Log

The following table lists all edits and amendments to this document since the original publication date. Information entered in the log must be complete and concise. Users of this standard operating procedure will promptly notify the project manager and/or the Great Lakes Network (GLKN) data manager about recommended and required changes. The project manager must review and incorporate all changes, complete the revision history log, and change the date and version number on the title page and in the header of the document file. For complete instructions, please refer to Revising the Protocol, SOP #13.

Previous Version #	Revision Date	Author (with title and affiliation)	Location in Document and Concise Description of Revision	Reason for Change	New Version #
1.0	5/01/2015	David VanderMeulen, GLKN	Updated the NPS contact author, distinguished between routine data summaries and periodic summary reports, added language about the use of web-based visualization and data summary tools, added resource briefs and newsletters as subsections under 10.4 Other Communications, fixed a handful of grammatical errors throughout	To clarify and update SOP based on changes that have occurred since Version 1.0 was published in 2008	1.1
1.1	8/31/21	Ted Gostomski, GLKN	Introduction and headers throughout.	“I&M Program” changed to “Inventory and Monitoring Division”. Dated material removed.	1.2
Add rows as needed for each change or set of changes tied to an updated version number					

10.0 Introduction

A primary goal of the Inventory and Monitoring Division is to ensure that the results and knowledge gleaned from monitoring are shared with all appropriate parties, especially the parks and their natural resource managers. Because the network's main focus is to assist parks with monitoring needs, we will strive to provide park managers with clear, meaningful products to convey our findings.

While the network primarily addresses concerns of the parks, its monitoring program has the potential to serve a much broader community. For example, monitoring projects can provide a starting point for external scientific research (especially to establish cause-effect relationships), and can provide insights for adaptive management on other public lands. The network is also accountable to multiple organizations within the federal government, including the NPS I&M Program and the U.S. Congress. To ensure accountability and to meet the requests of all parties, we will provide the types of reports and communications detailed below.

10.1 Summary Reports

Routine data summaries will be completed annually for lakes and parks that are sampled within that year. The summaries will be compiled from data that has been uploaded to the EPA's STORET database and Aquatic Informatics Aquarius database. Hard copy or web-based summary reports will be produced periodically, with the primary audience being park resource managers.

Web-based summaries will primarily be in the form of visualization tools that allow the user to query data to create customized water quality summaries, which are currently under development. Hard copy summary reports will document our efforts and convey the findings of previous field seasons. At a minimum they will provide:

- a brief introduction that describes why that Vital Sign is being monitored;
- an outline of the sampling strategy, including the number of sites sampled, parameters measured, and analyses performed;
- data summaries, including tables and figures to enhance visual presentation, as well as a text explanation of the findings;
- any other relevant or significant findings; and
- a limited discussion section in which important results are interpreted.

The project manager (aquatic ecologist) will take the lead in writing the report, coordinate an internal review, and take responsibility for providing the report to parks.

10.2 Analysis and Synthesis Reports

Detailed reports in which data are analyzed and synthesized will be produced on a periodic basis, with the frequency depending on the given Vital Sign. The first analysis and synthesis reports will be written after at least three years of water quality data have been collected at a given park. The

frequency of subsequent detailed reports will depend on the data and whether or not trends seem to be occurring. As lakes at the parks are monitored repeatedly, in-depth analyses will be conducted for each park as well as across parks.

The reports will be written in the format of a scientific journal article (abstract, introduction, methods, results, discussion, literature cited) and will contain in-depth analyses as outlined in the protocol narrative and SOP #9, Data Analysis. Further, these comprehensive reports will:

- place the observed results in both a regional and historical context by relating them to other published literature;
- discuss the significance of the results in terms of environmental change; and
- provide management recommendations based on the findings.

The project manager will take the lead in writing the analysis and synthesis reports, and will coordinate an internal review. The target audience of these reports will be the parks (primarily the natural resource managers), the network, and both regional and Servicewide I&M. Outside of the park service, the target audience includes the four state departments of natural resources (Indiana, Michigan, Minnesota, Wisconsin), the Minnesota Pollution Control Agency, the St. Croix River Interagency Basin Team, and the broader scientific community.

Drafts of analysis and synthesis reports will be reviewed internally and possibly sent to outside sources for further review, depending on how analytically complicated the methods are and on the gravity of the implications and recommendations.

10.3 Scientific Journal Articles

Because the inland lakes protocol has been designed with rigorous standards for sampling design and analysis, monitoring results are expected to be highly defensible and meet the standards of the peer-review process. The publication of monitoring results in scientific journals will allow the network to reach the scientific community in a way that internal NPS reports cannot. Further, peer-reviewed publications can promote collaborative investigation by members of the scientific community, either independently or in cooperation with the network. Ultimately, this process should foster a greater understanding of ecosystem components and processes.

For these reasons, the Great Lakes I&M Network will strive to publish analysis and synthesis reports in peer-reviewed scientific journals. We will encourage the preparation of manuscripts by having reviewers of analysis and syntheses reports recommend whether publication is warranted and suggest appropriate journals. The aquatic ecologist and network coordinator will track these recommendations and encourage and provide work time, respectively.

10.4 Other Communications

While reports are a definitive method of documenting the progress of each program, other means of communication can further disseminate information to a broader audience. To this end, we will provide the following additional types of communications:

Presentations to Park Natural Resource Managers

The project manager will periodically present the findings from the water quality monitoring program from previous years to the natural resource managers from the parks where monitoring took place. These presentations, which will likely occur at the annual technical committee meeting in March, will provide a concise synopsis of monitoring results as well as management considerations.

Conference Presentations

When possible, the project manager will present monitoring results at regional and national scientific conferences. Such presentations will allow the network to reach the broader scientific community, as well as land managers and conservation practitioners. Potential conferences include those sponsored by the Ecological Society of America, Society for Conservation Biology, The Wildlife Society, the Natural Areas Association, the NPS Water Professionals Meeting, and the George Wright Society. At a more local scale, the Western Great Lakes Research Conference, which is sponsored in part by the network, is a valuable venue for information exchange.

Resource Briefs

The project manager and assistant project managers will periodically publish short (typically one double-sided page) resource briefs (i.e., fact sheets) related to the GLKN aquatics program. These briefs, which are written for a lay audience, will convey key findings without using overly technical terminology or jargon. The briefs can be specific to a park (i.e., “Water Quality Monitoring at Inland Lakes at Pictured Rocks National Lakeshore”) or topical (i.e., “Monitoring North Manitou Island”). Hard copies of resource briefs are disseminated to parks, park partners, and other collaborators, and provided electronically on GLKN’s website.

Newsletter Articles

GLKN publishes a newsletter titled *The Current* in the spring and fall, in which the project manager provides plans for water quality monitoring and field season summaries, respectively. The project manager will also occasionally write water quality related feature articles for the newsletter. Hard copies of the newsletter are disseminated to parks, park partners, and other collaborators, and provided electronically on GLKN’s website.