

Standard Operating Procedure #1:

Pre-Season Preparation (version 1.1)

In Diatom monitoring protocol for the Great Lakes Network: Version 1.1

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Version 1.0 of this protocol and its associated SOPs received formal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data, and whose background and expertise put them on par technically and scientifically with the authors of the information.

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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 leader 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 footer 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	3/21/2019	D. VanderMeulen	Updated version # and authors on title pg. Removed references to NPSTORET database throughout; where appropriate referenced Neotoma online database. Updated link to online research permit.	New version w/ updated authorship. All data will now be housed in Neotoma. New NPS system and website to apply for a research permit	1.1

Acknowledgements

This standard operating procedure is based on SOP #1, Pre-season Preparation, by Axler et al. (2015), from the Water Quality Monitoring Protocol for Inland Lakes (Elias et al. 2015).

1.0 Introduction

Prior to the field season, many preparations must be completed to ensure sampling can be undertaken according to schedule. The field season for collecting surface sediment samples for diatoms from the Great Lakes Network parks is generally late summer/early fall. Coordination with personnel from the inland lakes water quality monitoring program will be necessary because surface sediment samples will be collected during the final inland lakes monitoring of the year. All details for the season should be planned well in advance. Field preparations should begin in January to allow enough time to order new supplies and equipment, as needed. Table 1 provides a checklist and general guidance for activities conducted prior to sampling. Many of these activities are discussed in more detail in other SOPs.

Table 1. Checklist of activities to be conducted prior to collecting surface sediments for diatom analysis.

√	Activity	Description
	Prepare calendar of planned field trips	Includes sampling dates, locations, and personnel. It will be necessary to coordinate with personnel from the inland lakes water quality monitoring program.
	Review sampling methods to determine if revision is needed	Check web reference to see if method has been updated from version currently used
	Review checklists of equipment and supplies required; prepare list of items to be ordered	Check each SOP for detailed equipment lists; check expiration dates of chemicals
	Order supplies	Includes specimen cups, centrifuge tubes, chemicals for sediment sample cleaning, microscope slides and coverslips, slide mounting medium
	Clean and test equipment; charge or replace batteries as needed	Includes surface sediment corer, camera, GPS unit, depth finder, cell phone or radio
	Obtain permission for site access, if necessary	
	Confirm research and collection permits for in-park sites	
	Check field vehicle and boat for safety equipment and supplies	Includes flares, flashlight, extra specimen cups, etc.
	Update field folder	Include maps, site information, field forms, sampling procedures
	Prepare headers on field data forms, and specimen cup labels	Header information should be cross-checked with metadata to permit entry into requisite database
	Review sample collection, processing, and documentation information	Includes methods, sample collection and processing procedures, and quality control samples
	Make travel reservations and arrangements as needed	
	Provide supervisor with field trip and call-in (check-in) schedule	

1.1 Read the Entire Protocol

Periodically read through the entire protocol, including all standard operating procedures (SOPs). Be sure to understand the purpose for which the various types of data will be collected and review the SOPs for the types of measurements and samples needed. Be alert for portions of the protocol or SOPs that may be in need of revision, and bring them to the attention of the appropriate supervisor.

1.2 Prepare Calendar of Planned Field Sampling

Well in advance of the field season, prepare a calendar of sampling dates for the entire season. Coordinate with personnel from the inland lakes water quality monitoring program because the surface sediment sampling for the diatom monitoring will be done during the last round of water quality sampling of the year. Allow for the possibility of unsuitable weather; sampling may have to be postponed. Include the location of sampling, dates, personnel, and any additional relevant notes (Table 2).

Table 2. Example of calendar of planned field sampling.

Location	Sampling Dates	Personnel	Notes
Indiana Dunes NL	September 15–20	Elias, Wise	
Voyageurs NP	August 15–20	Nauertz, Elias	

1.3 Review Checklists of Equipment and Supplies

Checklists help ensure that equipment and supplies will be ordered on time, data collection activities will be completed appropriately, and data quality objectives will be met. Review the detailed equipment lists that are included with each SOP (Table 3). Note expiration dates on all chemicals. Prepare a list of equipment and supplies that must be ordered and present it to the project manager.

Table 3. Checklists of equipment and supplies for diatom monitoring.

Checklist	Location
Safety equipment	SOP #2
Field supplies and equipment	SOP #4
Laboratory equipment and supplies	SOPs #5 and 6

1.4 Confirm/Apply/Renew Research and Collecting Permits

For sampling stations located within park boundaries, a Research and Collecting Permit must be obtained from each park separately before field work can be done. Submit an application or renewal application online to: <https://irma.nps.gov/rprs/>. Each park has a research coordinator who will issue a permit from that park. For samples that will be archived, curatorial paperwork may be required by

the parks. Work with the appropriate park representative to ensure all necessary archival forms are completed.

1.5 Update Field Binder

Field binders should contain reference information relevant to each sampling station, including maps of site locations and sampling collection and processing procedures. The field binder should be taken along on each sampling trip. Each year, prior to the sampling season, the field binder for each site should be reviewed and the following information updated as needed:

- *Location of sample-collection sites.* Review field notes for any indication that the location for sample collection may need revision. Update protocol if necessary.
- *Name of landowner, tenant, or other responsible party.* If the site is located on private land, ownership may change. Verify.
- *Current copy of research and collection permits (if site is located within NPS boundaries).* Check dates on permits. Renew/apply as described above.
- *Site access instructions (for example, call owner or site operator before arrival at site, obtain key to unlock security gate).* Confirm contact person, procedure, and phone numbers.
- *Photographs to document site conditions.* Take new digital photographs annually.
- *Maps to site (state and local).* Review map for accuracy; update if necessary.
- *Safety information (SOP #2).* Verify/update “Medical Information Form for Field Personnel” and “Emergency Contact Form.”
- *Field forms, including data collection field forms and specimen cup labels.* Prepare as many of the field forms as possible in advance (see SOP #4, Appendix A for a field data sheet). For each station, complete the header information, including the park code, lake name, date, etc. Place enough field forms in field folder to last the entire field season.
- *Ensure that copies of the current field procedures are included in the field folder.* Copies of procedures should be on waterproof paper. Use tabs to identify each procedure for ease of access while conducting field activities.

1.6 Clean and Test Equipment

Clean and test all sampling equipment, including surface corer, depth finder, camera, and GPS unit. Start each new field season with fresh batteries and replace spares from the field tool kit.

1.7 Vehicle, Boat, and Safety Gear

Check maintenance schedule of field vehicle and arrange maintenance, if needed. Check boats and vehicle for safety equipment such as flares, spare tires, triangles, cones, and first aid kit. Prepare a list of supplies needed and present list to supervisor. If using a trailer, ensure that taillights are in working order. Check that the field tool-kit is complete and replace tools, as needed.

1.8 Training and Safety

Keep current with training and the laboratory requirements associated with your data collection activities. New technicians will need basic skills training, including hands-on training and pilot-testing of equipment.

1.9 Field Reconnaissance

Field reconnaissance trips will not be necessary because water quality sampling will have occurred at least twice at each site before the surface sediment sample is collected. Be sure to check with personnel from the inland lakes water quality monitoring program to get information on boat access, road or trail closings, and any site access peculiarities.

1.10 Travel Arrangements

Make travel arrangements. Because hotel and campground reservations may be difficult-to-impossible to obtain at certain times of the year, it is important to review the sampling schedule and plan ahead. Submit park housing requests well in advance of the sampling season.

1.11 Communicate with Supervisor

Ensure the project manager is informed of supply needs, problems with equipment, changes in sampling schedule, changes in sampling site conditions, and other needs that may have an impact on the program budget, data collection, schedule, or sampling design.

1.12 Literature Cited

- Axler, R., E. Ruzycki, J. Elias, and D. VanderMeulen. 2015. Standard operating procedure #1: Pre-season preparation. *In* J. E. Elias, R. Axler, E. Ruzycki, and D. VanderMeulen. 2015. Water quality monitoring protocol for inland lakes: Great Lakes Inventory and Monitoring Network, version 1.1. Natural Resource Report NPS/GLKN/NRR—2015/1027. National Park Service, Fort Collins, Colorado.
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