Ministry of Environment and Climate Change Strategy

SURFACE WATER QUALITY STEWARDSHIP TOOLBOX

Project Planning Guidelines

Project planning is an important part of establishing a surface water quality monitoring program; it is needed to obtain commitments from partners and focus efforts to meet clear goals. This information sheet outlines components of project planning as they relate to surface water quality monitoring. Other Surface Water Quality Stewardship Toolbox information sheets, such as "Community Water Monitoring Start Up Guide" or "Steps to Establishing a Community Watershed Monitoring Network" should be used together with these project planning guidelines for optimum results.

- **Project Description**: Provides the definition and reasons for the project, the parameters to be sampled, and the study location. Study goals and objectives are also included in this section, which should be understood by all participants.
- **Participants, Roles, and Responsibilities**: A list of the partner stewardship groups and participants complete with capacity, roles and responsibilities creates a strong foundation for project completion.
- **Code of Conduct**: The expectations of conduct should be established as early as possible to ensure that everyone has the same understanding.
- **Budget and Funding**: Budgets and project funding should be determined during project planning, prior to the start of any data collection. Direct funding or in-kind contributions should be noted separately as they will be used differently. Also include sample shipping costs, lab analyses costs, equipment maintenance and supplies, and volunteer stipends (for example gas money).
- **Communication Plan**: Selecting appropriate methods for reporting data to target audiences will increase the readability and reception of the project results. This can make the project more meaningful and help refine the scope of data collection.
- **Metadata and Documentation**: This is important to ensure quality and consistency of data. Records of equipment maintenance and calibration are important to make sure that measurements are as accurate as possible (i.e., reduce uncertainty). Data collection records must include: the date and time of data collection, site specific location identifiers, latitude and longitude, equipment used and field observations. These will help ensure precision in sampling methods and can be helpful in data interpretation. Quality assurance/quality control protocols are necessary to ensure that the monitoring and data management methods are effective to obtain accurate results.
- **Protocols, Methods, and Equipment:** The protocols, methods, and equipment for monitoring are dependent on the parameters being tested in relation to the project objectives and waterbody. Sampling protocols should be based on the 2013 BC Ministry of Environment and Climate Change Strategy (ENV) Field Sampling Manual available here: https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/laboratory-standards-quality-assurance/bc-field-sampling-manual).

The following should be prepared: a monitoring plan, materials and equipment needed to monitor each parameter, what is required for maintenance/calibration of equipment, a checklist of required equipment and tasks before, during, and after data collection, the transfer protocol for shipping samples to a laboratory (if applicable), and any procedures needed for requests of laboratory analysis and for data storage. Refer to BC Ministry of Environment and Climate Change Strategy (ENV) Directory of Qualified Laboratories at https://www.nrs.gov.bc.ca/qualified-labs/ for a complete list of qualified laboratories and the chemical analyses that they are competent to perform.

- **Training**: Training ensures non-water quality specialists can successfully collect accurate and reliable water quality data. Training in field safety, equipment calibration/use, recording field observations, and monitoring protocols must be completed for volunteers and samplers prior to any data collection. For some projects, volunteer water stewardship teams may do large components of the field data collection.
- **Data Transfer, Storage, and Organization**: Data should only be stored in secure organizational devices, databases, or network drives, and should be quality controlled (reviewed and validated) prior to use or sharing. If data confidentiality concerns exist, ensure a data sharing agreement is in place. Data storage locations must be determined before data collection starts. This ensures data are in the correct format and include all necessary metadata for the database, and, where possible, allows data to be entered as it is collected. When ENV is a project partner, this step is usually initiated and carried out by ENV and the lab (if applicable), as water quality data produced in partnership with ENV is automatically uploaded to ENV's publicly accessible database (currently called Environmental Monitoring System (EMS)).
- **Data Analysis/Statistical Power**: Programs such as Excel are effective for some basic statistical analyses, but more powerful statistics programs such as various R-based language packages and functions can be used for more in-depth analysis. More information about interpretation of results can be found in the BC ENV Guidelines for Interpreting Water Quality document here: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/guidlines_for_interpreting_water_quality_data.pdf.
- **Data Sharing**: Data sharing is encouraged after data has been quality controlled but, to prevent data being used out of context, should be done only with those associated with a project until the project is completed. As mentioned above, if data confidentiality concerns exist, ensure a data sharing agreement is in place prior to data collection. If a data report is intended for the public, it should be presented in a report format appropriate to the audience.
- **Link Data to Action**: Water quality data are often used to inform action for water quality management, such as for future direction on policy and monitoring. Data reports will often put data results into the context of surrounding local conditions, then include recommended actions for improving water quality and adaptive management.
- **Evaluation**: This part of the process involves looking over the project from start to finish, and assesses the project's efficacy, resulting in feedback. Such evaluations are important to assess the planning process, the project, and the collaboration, with a focus on continually improving operations and addressing issues. This may be often overlooked but is critical to improve collaboration between organizations.

These materials were adapted from:

Kroetsch, N. C. (2021) *Improving environmental monitoring collaborations through co-development of data management plans: A guide for resource management agencies and environmental stewardship groups* [Master's functional deliverable, Simon Fraser University]. MRM.