

Guide to Writing a Water Quality Monitoring Plan



2013

Scoping Worksheets and Plan Template

This guide has been compiled by the Community-Based Environmental Monitoring Network and CURA H₂O to assist stewardship organizations in preparing a water quality monitoring plan.

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Using this Guide

Section 1 of this document provides background and scoping worksheets that can be used to identify and collect the information necessary for writing a monitoring plan. Section 2 provides a basic template that can be used as a foundation for writing the actual plan.

The information provided here is intended as a starting point. All monitoring plans are unique based on specifications such as location, objectives, geology, etc. and additional modification and adaptation of these resources should be applied as necessary.

This guide has been adapted from the *Virginia Citizen Water Quality Monitoring Program Methods Manual* and monitoring plan development recommendations provided by the Queensland Government (see references for detail).

Section 1: Background and Scoping

Step 1: Program Design Considerations

1. Existing Information

Program Design Considerations	
Project Details	
Project Name:	
Watershed Name:	
Stream/River Name:	
Study Area Information	
Stream Order:	
Ecozone:	
Ecoregion:	
Geology:	
Approximate Elevation:	
Surrounding Land Use:	
Dominant surrounding Land Use:	
Sources of Pollution	
Human-Induced:	
Natural Variation:	
Government Bodies	
District:	
Municipal:	
Provincial:	
Federal:	
Related Non-Government Organizations (NGO)	
Stewardship Groups:	
Other:	
Other Considerations	
<p>Are there any other organizations (including polluters) that are currently conducting water quality monitoring in the study area?</p> <p>Is there any existing baseline information that would help your program? Can you access this information? Who will acquire it?</p>	

Table by Emma Garden, adapted from CABIN materials and the Vancouver Island University Freshwater Sampling and Design Manual

1) What waterbod(ies) do you want to monitor?

2) Are there known issues in your watershed? In the specific water body that you will be focusing on? What are they?

3) Does any previously existing water quality data or reports indicate water quality issues? What are they?

Collecting sufficient background information helps to define your monitoring goals and objectives

2. Purpose

1) Why are you interested in monitoring the particular water body?

2) Is this study for restoration purposes, community education purposes, etc? Be specific.

3) What do you hope to achieve by conducting this monitoring program? What are your overall goals?

4) List the questions you would like to address with this study. For example, is the pH increasing over time? Has the water quality deteriorated over time?

Questions/Issues to Address	Information Needed
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5) How long should this project continue in order to answer these questions or achieve the program's goals?

Step 2: Type of Monitoring Program

Examples of types:

Impact assessment: assess the effects of a land use activity/project (ex: agriculture, mining, recreation, urban developments, etc.) on a water body

Compliance: ensure that potentially harmful activities do not have a negative impact on water quality or the aquatic ecosystem

Trend: takes place over several months or years to identify certain variations in parameters that affect water quality

Survey/Investigative: establish a baseline set of water quality data for a water body. May dictate the need for other forms of monitoring

1) Which type of monitoring program is most suitable to achieve your monitoring goals and objectives?

2) Why did you choose this type?

Step 3: Selecting Monitoring Locations and Sites

Where will you monitor?

Site #	Brief Description of Site Location	GPS Coordinates (decimal degree format – hddd.ddddd)	Parameters to Monitor

To consider when choosing sites:

Will the site have sufficient water during the times of year that sampling will take place? Will it be dry? Frozen?

Is the site in a safe location on public property? Will it be possible to obtain landowner permission for sites on privately owned land?

How is the location situated in relation to drains, tributaries, dams, bridges, or other structures that may influence the results? How does this relate to your objectives and program type?

Step 4: Selecting Monitoring Parameters

Biological/Chemical/Physical

What parameters and conditions will you monitor?

	Field or Lab Analysis	Sampling Method	Why will you monitor this parameter?
Dissolved Oxygen			
Conductivity			
pH			
Salinity			
Total Dissolved Solids			
Turbidity/Transparency			
Temperature			
Phosphorus			
Nitrogen			
Flow			
Chlorophyll <i>a</i>			
Benthic Macroinvertebrates			

1) Do you have the necessary equipment to measure what is required for baseline data? (temperature, electrical conductivity, pH, dissolved oxygen and total suspended solids)

If not, can you borrow, rent, or purchase it? How or from where/whom?

Step 5: Sampling Frequency and Duration

When will you sample?

Site	Parameter	Frequency	Time of Year (Season)	Time of Day	Special Weather Conditions

To consider in choosing frequency and duration:

What time of day is best for sampling? (Temperature, for example, can fluctuate naturally as the sun rises)

What time of year is best for sampling?

How frequently should monitoring take place?

**Consider these in relation to achieving monitoring goals and objectives*

Step 6: Data Use and Management

1) Who will use data from this monitoring program?

Data User:	Data Use:	Level of Data Quality Needed:

2) How will you ensure the quality of your data?

3) Who will manage and analyze the data?

4) Who will data be available to and how?

5) Who will collect samples and/or data?

6) Where will the data be stored? In what format?

7) Who will transcribe/transfer field data to permanent storage?

8) Where will you keep the hard copies of data?

Step 7: Quality Assurance, Quality Control, and Safety

1) Is a Quality Assurance/Quality Control Project Plan (QUAPP) needed for the intended use of data?

2) Who will write Standard Operating Procedures (sampling methods, techniques and protocols)?

3) What training is required to conduct sampling? (initial and refresher training requirements)

4) Who will calibrate and/or maintain monitoring equipment? What training is required?

5) Have a site survey and risk assessment been conducted? Were any risks identified? What are they? How will they be mitigated?

6) Is any safety training required (WHMIS, first aid, swift water rescue training, transport or dangerous goods training)? How will it be provided? How often?

7) Is any specific equipment or resources required to safely work at the sampling location? (First Aid kit, life jackets, footwear, reflective jackets, MSDS sheets) Will they be provided?

Section 2: Sample Monitoring Plan Template

1. Title and contact information

Project Title:

Organization Name:

Contact person(s for project):

Phone Number:

Email:

Mailing Address:

2. Purpose, sites, frequency, duration

Name of water body to be sampled:

Person(s) responsible for monitoring/sampling:

Purpose of monitoring:

Sampling locations:

Site name/#	Brief Description of Site Location	GPS Coordinates (decimal degree format – hddd.ddddd)	Parameters to Monitor	Safety or access considerations

Frequency and Duration:

Site	Parameter	Frequency	Time of Year (Season)	Time of Day	Equipment or sampling method

3. Data management and reporting

Person(s) responsible for data management:

Data recording method(s):

Data storage method (including backup copies):

Intended data use:

Person(s) responsible for data analysis and reporting:

Reporting format(s) and frequency:

4. Quality assurance and quality control

Is a Quality Assurance/Quality Control Project Plan (QUAPP) needed for the intended use of data? Who will write it? (Append completed plan to this document)

Date completed:

Who will write Standard Operating Procedures (sampling methods, techniques and protocols and safety procedures and training)? (Append completed SOPs to this document)

Date completed:

References and Additional Resources

Virginia Department of Environmental Quality Citizen Monitoring Guidance: There is a link on the bottom of this page to the Virginia Citizen Water Quality Monitoring Program Methods Manual:

<http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/WaterQualityMonitoring/CitizenMonitoring/Guidance.aspx>

Virginia Water Monitoring Council Reference Materials webpage: This page includes links to a variety of resources for non-governmental water quality monitoring information. Examples of topics include monitoring manuals, newsletters, QUAPP design, and general resource/support networks:

<http://vwrrc.vt.edu/vwmc/ToolsWaterMonitorsVolunteers.asp>

Oregon Department of Environmental Quality Volunteer Monitor Resources:

<http://www.deq.state.or.us/lab/wqm/volmonresources.htm>