



SURFACE WATER QUALITY STEWARDSHIP TOOLBOX

Field Meter Stream Monitoring

This is a template information checklist for a water quality monitoring project collecting only temperature, dissolved oxygen (DO), conductivity, and turbidity data using field instruments in a river or stream. It outlines taking five weekly samples within a 30-day period (5 in 30s) in order to compare results to chronic (long-term) BC Water Quality Guidelines (<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines>). **Your project may vary depending on project goals, additional sampling parameters, and partnership agreements.**

Most volunteer 5 in 30 sampling occurs during summer low flow and fall flush periods. It is very important that none of the five sample dates are missed, or the data cannot be directly compared to the chronic guidelines/objectives. Valuable sampling periods to add, if applicable, are spring freshet in high snowfall areas, spring fertilizer application periods in agricultural areas, or summer/fall fertilizer application periods in forests.

Spring melt/freshet	Spring fertilization	Summer low flow	Fall flush
Start date should be as close to snowmelt event as possible	Start as close to fertilizer spreading as possible, usually in March/April	Start in August as close to low flow as possible	Start date should be flexible to capture fall first flush event (first large rainfall) after summer

What you should have to complete sampling (may vary depending on project):

- Trained field samplers
- Temperature/DO/conductivity meter, turbidity meter
- If performing quality assurance/quality control (QA/QC) with grab samples, you may have sample bottles in a cooler with requisition forms (see separate grab and QA/QC sampling instructions)
- Calibration items
 - Conductivity standard solution (bottle), turbidity standard solutions (included in turbidity kit)
 - Meter maintenance supplies (extra batteries, screwdriver to access battery compartment, Kim Wipes, residue-free dry air canister, extra DO membranes/solution, brush for cleaning conductivity sensor, bottle with clean water for rinsing equipment after turbid sites)

- Folder of paperwork
 - List of sites and site descriptions, map (if available); sampling, calibration, and safety protocols, access agreements (if applicable)
- Miscellaneous items
 - Field notebook with waterproof paper/data entry tablet
 - Pencils
 - Drinking water and snacks
 - Camera
 - Sample gloves
- Safety gear
 - Safety check-in arranged (tell someone where you are going, your expected return time, and keep them informed)
 - Regular sites: good boots, first aid kit, appropriate clothing/protection for the weather or site hazards, gear for water condition (e.g., PFD)
 - Logging road sites: above items plus reflective vests, hardhat, VHF radio (if applicable) (know logging road callout procedures)

Upon completion of any seasonal sample period, do quality control on your data and submit the applicable data sheets to ENV Project contact.

Upon completion of all project sample periods (i.e., mid-November, if not earlier), return all loaned items, as well as field notes back to your group head, if applicable.

Contact information (fill in contact information organized during project planning phase):

ENV contact (responsibilities may vary but usually help with meters, sample protocols, technical advice)	Other partner contacts (responsibilities will vary with partner but may include logistics, help with meters)

Stream Monitoring Protocols

PREPARATION FOR FIELD:

1. Ensure field meters have adequate battery power (charge or replace batteries).

2. On the day before or the morning of the sample day (within 24 hours of site visit), calibrate meters as per instructions on calibration protocols. **Record calibration results in a calibration log.**
 - a. NOTE – For our purposes conductivity is measured and recorded as specific conductance (SpC). SpC is electrical conductivity corrected/compensated to 25°C. Ensure the field meter is set to compensation at 25°C (not another temperature value) and that the SpC (not the conductivity) value is recorded.
3. For sample day, check that your sample party of minimum two people (for safety) have all items needed for sampling listed above.

IN THE FIELD:

1. If you have to walk in the stream, always walk downstream of where you will be taking your sample, being careful not to disturb sediment.
2. Prep field sheet: date and time (24 hr clock), EMS ID site number, site name, and sampler name.
3. Make notes on site conditions (weather, changes from last visit, anything that may obviously be affecting water quality).
4. Temperature/DO/conductivity meter (your meter may vary but for this outline we will talk about using a YSI meter) readings:
 - a. Prep YSI probe by removing clear calibration/storage cup and replacing it with black perforated cover (protects probes), turn YSI meter on.
 - b. Place YSI probe **gently** as far out in stream as possible in flowing water (if possible) downstream of where turbidity sample is to be taken, to ensure no sediment is disturbed. YSI probes should be fully submersed in the flowing part of the stream, as close to perpendicular as possible, and not laying in fine sediment that can be easily disturbed.
 - i. Wait for readings to stabilize (30 - 60 seconds for YSI galvanic DO sensor; this may vary depending on meter used, always refer to manual that came with your meter) and record results into field notebook, including name of parameter measured and units in which it was measured (Temp: °C, DO: mg/L, Specific Conductance (SpC): µS/cm, pH: pH units).
 - c. Turn off YSI meter.
 - d. Remove black perforated cover and replace with clear calibration/storage cup, ensuring cap has 0.5 cm water (clear creek water is fine) in bottom. Note: too much water can cause the probes to need more frequent replacement.
5. Turbidity meter
 - a. Due to the wide variety of turbidity meters available, detailed instructions are not included here. Please refer to the manual that came with your meter.

- b. Turbidity readings are very susceptible to contamination and thus poor-quality results if there is any protocol drift. Maintain clean instruments, do not disturb sediments, and follow instructions exactly as recommended in turbidity meter manual.
 - c. Write results into field notebook, including name of parameter measured and units in which it was measured (Turbidity: NTU).
 - d. Turn off turbidity meter.
 - e. Clean and dry meter and any additional components for proper storage.
6. Collecting replicates or a water sample (if performing QA/QC)
- a. Please see detailed instructions in separate Stream Grab Sampling (QA/QC) Procedures if filling bottles for QA/QC.
 - b. If taking replicate field meter readings for QA/QC, simply record a second reading following the above procedures for 10% of samples.

UPON RETURN FROM FIELD:

1. Ensure that any specific post-sampling equipment care is completed. Recharge and replace batteries if applicable.
2. Store equipment in a cool dry location. Know proper storage procedures for all equipment (e.g., storage between sample dates and winterization) to extend life of equipment.
3. Do QA/QC on field notes (check for transcription errors, missing information or out of range data – more details on QA/QC are outlined in **Stewardship Data QA/QC Guidelines** information sheet), then store field notes in a safe place or submit to appropriate project partner. Transcribe data results from field notes to an electronic file or upload instrument data to a secure archive (if applicable).
4. Set calibration date for next site visit.
5. Return any borrowed equipment if applicable.