

# PHOSPHORUS MONITORING

## WHY

In freshwater environments, phosphorus is often a limiting nutrient, meaning that it is naturally found in relatively low concentrations compared to other essential nutrients. Because of this, the available concentration of phosphorus, more so than other important nutrients, is what determines how much biological activity can occur, and in this way, phosphorus plays a key role in ecosystem balance. When excess phosphorus is introduced to a freshwater habitat through agricultural runoff or organic waste (e.g., raw sewage), rapidly proliferating organisms such as algae can take advantage and grow without restrictions, which can have negative consequences such as algal blooms. Measuring total phosphorus can give us insight into the capacity for biological activity in a certain area and could give us advance warning if there is a risk of algal blooms.



## WHEN

Phosphorus monitoring takes place over the course of the entire summer, with site selection and setup occurring in April and final samples collected towards the end of October.

## WHERE

Samples are taken from mid-channel locations, typically from a bridge to allow for access without disturbing the stream bed. Locations with proximity to flow data are prioritised however, other locations may also be selected based on a variety of considerations including how safe it is to access the location and collect a sample.



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## HOW: Equipment

Volunteers will be provided with 300 mL nutrient sample bottles (green cap bottles) filled with 0.3 mL of 50% sulphuric acid\*, 118 mL bottles (white cap bottles) for collecting turbidity data, a funnel, disposable nitrile gloves, and return shipping material. Volunteers will also need a pen, a small bucket and rope.

***\*DO NOT** open your green cap bottles until you are ready to add your sample into it. **Sulphuric acid can be corrosive.** Volunteers should take precautions to avoid getting any on themselves. If they do have contact with the acid, be sure to rinse immediately with lots of water.*

## HOW: Procedure

### Step 1: Preparation

- Navigate to the location
- Check all equipment and materials needed for sampling
- You will be notified when to sample by email

### Step 2: Collect samples in the field

- Bring one sample bottle with green cap (for total phosphorus) and one bottle with white cap (for turbidity), one pair of gloves, a funnel, a pen, and a clean bucket with a rope attached to your sampling site.
- Fill out the appropriate data in the data sheet or google form and add the required data to the label on the sample bottle with date and sample location.
- Take reference photos using benchmark photography.
- From a location above the centre of the stream, lower your bucket, allowing it to be submerged and filled. Partially filled is sufficient, the samples should be taken from below the water's surface, however care should be taken to ensure that the bucket is not touching the riverbed when the sample is collected. If the bed of the stream is disturbed, wait a few minutes for the sediment to disperse and retake the sample. *(Note: Rinse the bucket 3 times before collecting the sample if you forgot to clean it before)*



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## HOW: Procedure (cont'd)

### Step 2: Collect samples in the field (cont'd)

- Put on your gloves to protect against contamination **but also to protect you from the sulphuric acid** preservative in the sampling bottle.
- Collect water from the bucket and fill the sampling bottles (**one green cap** bottle and **one white cap** bottle). Be sure to fill the bottle to the fill line marked on the sample bottle, but do not overfill by leaving some space at the top. *(Note: All samples must be at or above the fill line; if the sample is below this line, it cannot be processed.)*
- Securely cap your sample bottles.



### Step 3: Mail collected samples

- Samples **need to be mailed as soon as possible after final sample collection** to minimize any changes in the total phosphorus concentration. Ensure the bottles are labelled with your name, sample location and date / time collected. Place the bottles and sampling sheets in the same envelope materials were shipped in. Seal the envelope, affix the label provided and drop it off at a nearby post office or postal drop off location.
- Labels to send the samples will be sent **via email** prior to the sample collection date. You can print the label at home or get your **label printed at the Canada Post** location by bringing in provided code.

### Step 4: After samples mailed

- Fill in the Google Form or Datasheet that was distributed to you (if you haven't done this in step 2).
- Send by email reference photos and scanned datasheet (if applicable).

*Note: For health and safety reasons, it is always important to wash your hands after you complete a sample collection once you return home.*

## CONTACT

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