

COCO sampling instructions

Updated Apr. 2026 by S. Beal

Equipment

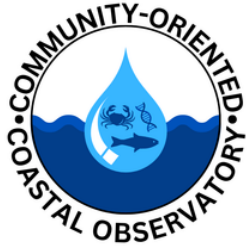
- Smith-Root eDNA citizen scientist sampler in plastic tote
- Battery and charger
- Pencil case containing pencil, sharpener, eraser, and permanent marker
- Clipboard with text-based instructions
- Metadata sheet
- 3x bagged filter housings
- 3x paper envelopes
- 3x 10 ml tubes of orange desiccating beads
- 3x gloves
- Garbage bag
- Flat-rate Canada Post shipping box



(1) Ready-to-use eDNA machine

Pre-sampling instructions

1. At least one day before sampling, pick up the sampling machine from its community storage location.
2. At least one day before sampling, charge the sampler battery by connecting it to the provided charger: red-to-red, black-to-black (Figure 2).
 - A fully charged battery has 6-8 hours of charge.
3. Using a permanent marker, fill in the provided bag labels **except final water volume** and stick one to each of the three filter housing bags.
4. Using a permanent marker, number the paper envelopes.
5. Prior to going to site on the day of sampling, reconnect the battery to the sampler and put the charger back in its box.
6. Ensure the 2 L collection tank is securely placed in the sampler and its lid is tightly closed, sample tubing is connected, and the vacuum tubing is attached to the bottle air intake (see Figures 1, 3).
7. Put all equipment back in plastic tote for easy transport to site.



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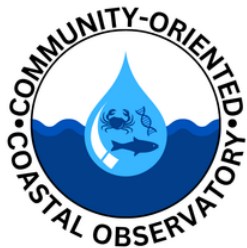
Sampling instructions

Set up

1. Once at the site, find a comfortable position for filtering. Ideally, place the sampler on level ground or have a buddy hold it.
 - The sampler is ~10 lbs and will become heavier once the collection tank is full.
2. Fill in the metadata sheet and filter housing bag labels (if not already done)

During sampling, three replicate samples will be collected per site

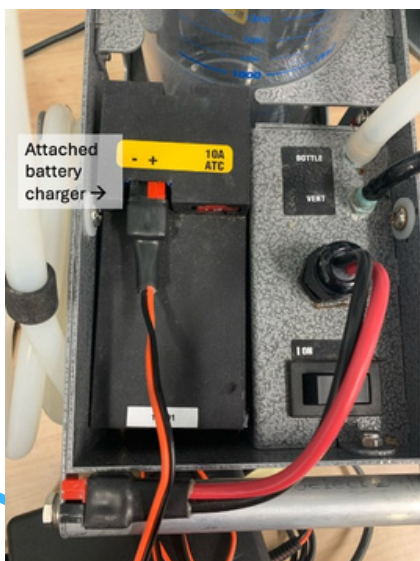
1. Wearing clean gloves, open the filter housing bag of replicate one and remove the filter housing.
2. Keeping the snorkel in the bag to maintain sterility, attach the snorkel to the opaque, beige end of the housing (Figure 4).
3. Remove the filter housing with attached snorkel from the bag and attach the black, barbed end of the housing to the suction tubing of the sampler (Figure 4).
4. Place snorkel into water, turn on pump.
 - Ensure the filter housing does not become submerged in the water – only the snorkel – as this may lead to an inability for water to pass through the filter housing (see Troubleshooting #1).
5. Filter until water reaches the red line of the collection tank; once at the red line, remove the snorkel and filter housing from the water and turn the filter housing upside-down.
6. Allow the pump to run through upside-down filter housing for 20 seconds to air dry filter.
7. Turn off the machine, shake as much water out of the snorkel and filter housing as possible before detaching snorkel. Set aside to be returned in the mail.
8. Open the filter housing and using the provided tweezers, pick up the filter and place it inside a pre-labeled paper envelope.
9. Fold the envelope closed and place it back inside the filter housing bag. Pour one tube of orange desiccating beads into the bag and seal, removing as much air from the housing bag as possible.
10. Ensuring the outside of the filter housing bag is dry, record the final water volume filtered on the sticker label with a permanent marker.
11. Open the collection tank and discard the water in the collection tank at least one meter away
 - If disposing of collection tank water in water, discard downstream of sampling site.
 - If disposing of collection tank water on land, ensure it will not run back into sampling area.
12. Repeat steps 1-11 twice more, for a total of **three** replicate eDNA samples.
 - Filter samples in replicate order, beginning with one and ending with three.



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Post-sampling instructions

1. Once all three replicate sample have been collected, allow consumables to dry before placing the used filter housings, snorkels, tweezers, filters in their bags, metadata sheet, and 10 ml plastic tubes into the return shipping box. Fill in sender information.
2. Drop-off shipping box at a Canada Post office within **one week** of sample collection.
3. Wipe down the machine with a damp cloth and ensure plastic tote is clean.
4. Unfasten the lid of the collection tank to allow all remaining water to evaporate off.
 - Tubing does not need to be detached for this step – the lid can rest against the lip of the collection tank once unfastened.
5. Dispose of garbage bag.
6. Once the collection tank is dry, re-secure the lid onto the collection tank.
7. Place these instructions, sampling machine, charger, pencil case, and first aid kit back into the clear plastic tote.
8. Bring tote back to community location.
 - Please be mindful of their operating hours.
 - Ensure the box is clean with no sand on the inside or outside.



(2) Charging configuration

Attached sample tubing →



(3) Attached tubing

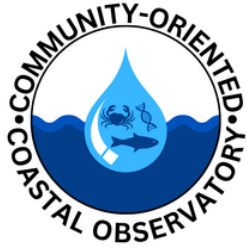
← Unplugged sampler battery connection



(4) Components of the filter housing. **NOTE** the barbed end of the filter housings COCO is using are black instead of yellow.

Assembly is the same.

Photo credit: Smith-Root.



COCO sampling instructions

Troubleshooting

Unfortunately, sometimes sampling does not go according to plan. Below please find some common issues and their corresponding fixes. In the event none of these resolve your issue, please make a note of the problem on the metadata sheet and record the total water volume you were able to filter through the problematic filter housing.

1. The filter housing became submerged and water is no longer passing through the tubing and into the collection tank

- When the top of the filter housing becomes submerged, it can lead to filtering issues.
- Wearing a new pair of gloves, detach the black, barbed end of filter housing from the suction tubing.
- Open the filter housing and pour out any water (any collected eDNA should already be on the filter so be careful not to touch it or the attached snorkel).
- Close the filter housing by reattaching the black and beige halves together and reattach the black, barbed end of the housing to the suction tubing.
- Place the snorkel of the filter housing back into the water and resume filtering.
- Once 2 L has been filtered or 10 minutes **total** filtering time has passed, remove the snorkel from the water and turn the filter housing upside-down.
- Allow the pump to run for 20 seconds to dry out the filter before turning off the machine.
- Shake as much water out of the snorkel/filter as possible before detaching snorkel and preserving the filter in a paper envelope and placing it back in the filter housing plastic bag with desiccating beads. Remove gloves and dispose of in garbage bag.
- Ensuring the outside of the filter housing bag is dry and record the final water volume filtered on the sticker label with a permanent marker.

2. The filter housing did NOT become submerged but water is no longer passing through the tubing and into the collection tank

- The filter is likely clogged. This can happen where there is a lot of debris in the water.
- Once 10 minutes total filtering time has passed, remove the snorkel from the water and turn the filter housing upside-down.
- Allow the pump to run for 20 seconds to dry out the filter before turning off the machine.
- Shake as much water out of the snorkel/filter as possible before detaching snorkel and preserving the filter in a paper envelope and placing it back in the filter housing plastic bag with desiccating beads.
- Ensuring the outside of the filter housing bag is dry and record the final water volume filtered on the sticker label with a permanent marker.

If you have identified a problem with the sampler not listed here, please let us know!