

Collecting a Surface Water Sample

CAUTION: Never carry or lift the pole above your head, as touching power lines could cause electrocution.

Notes:

- Students (<12 years) will require an adult to hold onto them while they collect the sample.
- Ensure you are standing on a stable, level surface away from the edge of the bank.
- Collect your rinse sample downstream of your collection site.
- Tip the rinse water onto the bank to prevent stirring up the sediment.

Equipment: Long arm sample pole, snap adaptor and sample bottle

1. To loosen the extension handle of the long arm sample pole, turn to the left. Extend the pole, with the sample bottle in place. Make sure the pole is not too long and difficult to handle. Twist handle to the right to lock the pole into place.
2. Turn the bottle face down over the water and fully submerge the bottle.
3. Once the bottle is fully submerged, turn it upwards and allow it to fill.
4. Bring the sample in and tip it onto the bank. Repeat this to rinse the bottle twice.
5. Using the same collection methodology a third time, collect your sample to test.
6. Close the extension pole and twist right to lock in. Take sample bottle out of the snap adaptor. Continue with temperature test.

Test 1: Temperature

Notes:

- Ensure the thermometer is completely dry before taking the air temperature.
- Make sure you keep the thermometer in the water while taking the water temperature reading, otherwise the result is inaccurate.

Equipment: Thermometer**1a: Air Temperature**

1. Hold the thermometer at waist height by the top of the thermometer in the shade of your body.
2. Wait for at least one minute before reading the thermometer.
3. Ask another person to check the result.
4. Record your result.

1b: Water Temperature

1. You should take the temperature from the actual waterway as close as possible to where you took the sample. If you can't reach the water then test water in the sample bottle immediately after taking the sample.
2. Lower the base of the thermometer into the water and hold for one minute. Read the thermometer while it is still in the water and when the reading stabilises.
3. Ask another person to check the result.
4. Rinse the thermometer with distilled water to remove any contaminants, dry and place back into the kit.
5. Record your result. Return to a safe location to test your sample.



Test 2: pH

Equipment: MN pH strips, small container, distilled water
--

1. You can either test your pH in a small container or the sample bottle. Ensure there is enough water to cover the 4 coloured squares on the pH strip.
2. Take one pH strip, being careful not to touch the coloured squares.
3. Place the coloured squares in the water and leave in for 5 minutes.
4. Take the strip out of the water. The colours will have changed depending on the acidity or alkalinity of the sample water.
5. Hold the box in your left hand, making sure the numbers are up the right way, and the strip in your right hand.
6. Run the strip up and down the box until you match the colours of the strip to the colour chart on the side of the pH strip container.
7. The pH will be the closest match to ALL colours. **You may estimate between the two colours in 0.5 increments.**
8. Pass the strip to others to verify, and record your result.
9. Empty the contents of the small container. Rinse the small container with distilled water and put the strip aside to dispose of later – it can only be used once!

Test 3. Electrical Conductivity (EC)

3a(1). Calibrating the Eutech Green ECScan Meter

Equipment: Electrical Conductivity Meter (low or high range), specimen container, distilled water.

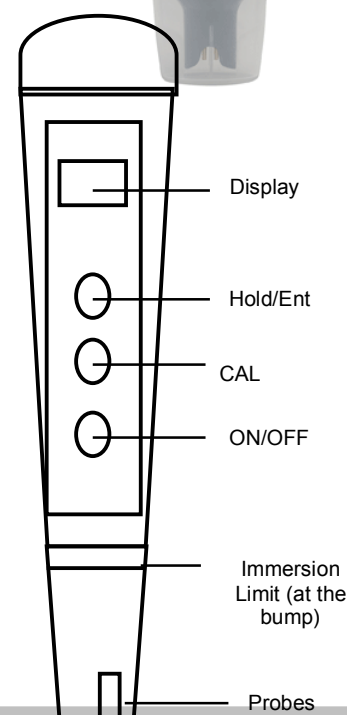
First check to see if your meter needs calibrating by dipping the electrodes into the conductivity standard and swirling. If the meter reads the same as the standard it does not need calibrating.

Low meter = 500 μ S/cm standard

High meter = 12.9 mS/cm standard

1. Pour enough 500 μ S/cm calibration solution into clean beaker to cover probes (a depth of approx 3cm or 30mL in your small beaker).
2. Take bottom cap off the EC meter and turn on (by pressing 'on/off' button)
3. Dip the probes into the calibration solution and swirl the container, meter and solution.
4. Wait several seconds until the number stabilises. If the reading matches your calibration solution, you can stop here & rinse off the meter. If not, go to Step 5.
5. Press the CAL button to put into calibrate mode & the numbers on the screen will flash. Quickly then use the HOLD/ENT button to scroll up & around to come back 500.
6. Then, wait 3 seconds without pressing any buttons; the display will flash 3 times then shows 'Ent'. **The meter is now calibrated.**
Note: If it doesn't read 500 on the screen after calibrating, repeat the process from Step 5.
7. Take the meter out of the solution, rinse probes with distilled water.
8. You can now continue on with your EC test on sample water, or turn off & put away if you'll use it later for testing.

The meter is now calibrated



Discard the calibration solution after use. Never return it to the container

3a(2). Calibrating the Eutech Beige ECScan Meter

Equipment: Electrical Conductivity Meter (low or high range), specimen container, distilled water.

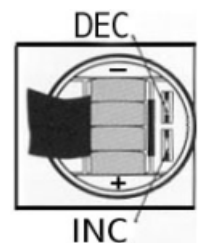
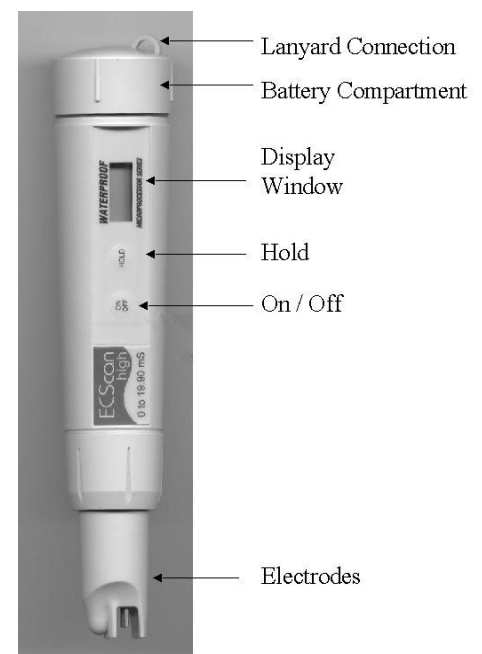
First check to see if your meter needs calibrating by dipping the electrodes into the conductivity standard and swirling. If the meter reads the same as the standard it does not need calibrating.

Low meter = 500 μ S/cm standard

High meter = 12.9 mS/cm standard

Procedures:

1. Rinse a clean calibration specimen jar with shaken calibration solution. Pour approx 3cm of calibration solution into the beaker.
2. Unscrew the top of the meter (battery compartment) and identify the white buttons (**DEC**rease-**INC**rease buttons).
3. Orientate the battery compartment as shown in the diagram.
4. Turn on the meter (by pressing the 'on/off' button).
5. Remove cap and dip the electrodes into the beaker of calibration solution
6. Swirl the meter with the electrodes submerged in the solution but not touching the bottom.
7. Wait several seconds until the number stabilises.
8. Press the **DEC** or **INC** key once (number will flash) to put meter into calibration mode, then use the buttons to adjust reading to match the calibration standard value.
9. Wait 3 seconds without pressing any buttons; the display will flash 3 times then shows 'ENT'. The meter is now calibrated. Take the meter out of the solution.
10. Turn off the meter and replace the battery compartment top. Rinse the electrodes in distilled water, dry and replace the cap.



The meter is now calibrated

Discard the calibration solution after use. Never return it to the container

Remember to calibrate + check the batteries

3b. MEASURING Electrical Conductivity with an ECScan Meter

Equipment: Electrical Conductivity Meter (low or high range), specimen container, distilled water.

1. Rinse out a specimen container with sample water at least twice, or test straight from the sample bottle.
2. Pour sample water into the specimen container to a depth of about 3cm.
3. Remove the cap from the meter and turn it on. Wait until a 0 appears.
4. Dip the meter into the container so that the probes are covered. **Only immerse the probes of the meter in the water. Do not rest the probes on the base of the container as this will give an inaccurate reading.**
5. Hold the meter in the sample water and swirl gently, so that the sample water, container and meter move. Allow time for the number value to display and stabilise on one reading. If the reading doesn't stabilise, record the result as the number that was displayed most frequently.
6. Read the result from the meter screen.
7. Identify the unit of measurement that the meter is reading ($\mu\text{S}/\text{cm}$ or mS/m). **If your meter reads 'Or', go to 3c procedure for dilution** (or swap to using an EC High if you originally used EC Low for this test).
8. Pass to others to verify the result.
9. Rinse the probes in distilled water. Do not wipe the probes of the meter – blow on the probes or allow to dry in the air.
10. Replace the cap on the meter. Turn the meter off and record your result.



*Rain water is around $200\mu\text{S}/\text{c}$; Humans can taste it easily at $800\mu\text{S}/\text{cm}$.
In estuarine environments salinity varies significantly depending on tidal influences and amount of freshwater entering the system.
Ocean water is approximately $65\,000\mu\text{S}/\text{cm}$.*

3c. EC Dilution – Estuarine or highly saline areas only

When measuring salinity, some samples may exceed the limit of salinity the meter can measure. An 'Or' will appear in the screen (over range). The sample will need to be diluted in order to get a reading.

Method: For estuarine water, start with a 1:2 dilution factor and a **high range** EC meter.

Example: Dilution 1:2 (sample after dilution = 30mL)

Original sample 10mL & Distilled water 20mL

Note: A 1:2 solution is 1 part sample water and 2 parts distilled water.

Diluting the sample:

1. Measure 10mL of the sample into the 50mL specimen tube or measuring cylinder.
2. Add distilled water to make up a total of to 30mL in cylinder.
3. Pour the diluted sample into a clean specimen tube and mix thoroughly by rotating the container.
4. Carry out the EC test using the EC meter as usual (see 3b).
5. Record the number displayed on screen.
6. Rinse the probes of the meter with distilled water.
7. Calculate the result by multiplying the no. on screen by 3 (dilution factor – total number of parts in dilution).
8. Convert the result from milliesiemens (m/cm) to microsiemens (μ S/cm) (for high range meter) by multiplying by 1000.

No. on Screen	Multiply by Dilution Factor	Milliesiemens mS/cm	Convert to Microsiemens μ S/cm	μ S/cm
	x 3 =		x 1000	

9. Record your result on the database in μ S/cm.

Note: If 1:2 dilution again gives an "OR" reading dilution may need to be 1:3 (10mLs sample, 30mLs distilled water) or 1:4 (10 mLs sample water , 40mLs distilled water) when multiplication will be by 4 or 5 instead of 3.

Test 4: Turbidity

Notes:

- The test must be conducted in the shade of your body. Put your back to the sun and the tube should be in the shadow.
- When looking into the tube, the top of the turbidity tube should be at least 15cm from your eye for safety and quality assurance.
- Ensure you shake the bottle to disperse any sediment that has settled before beginning this test.
- **DO NOT estimate between the lines.**

Equipment: Turbidity tube

1. Assemble the turbidity tube by sliding the two pieces together.
2. Shake the water sample in the sample bottle.
3. Pour a little bit of water into the tube. Holding the tube vertically, look down into the tube. You may need to wait for the water to stop swirling to see if lines can be observed clearly. If you can still see them clearly, continue pouring a little at a time.
4. Stop pouring when the three distinct black lines at the bottom of the tube cannot be seen clearly. Ask another person to verify your result.
5. Measure the turbidity by recording the last marked point on the tube **below** the level of the water. **DO NOT ESTIMATE BETWEEN THE LINES.**
6. If you can still see the lines when the water has reached the top of the tube, record the result as 7 NTUs.
7. Record your result. Rinse the tube with clean water and place it back in the kit.

