Westcountry C.S.I.
Citizen Science Investigations

Welcome. Westcountry CSI is a growing community of citizen scientists taking a closer look at our local rivers across Somerset, Dorset, Devon and Cornwall.

Our aims are:

- to record as many surveys as we can from across the region, literally putting the lesser known Westcountry rivers on the map!
- to use the data to flag up persistent, low level pollution problems or areas where we can improve habitat – this will help us develop future projects and volunteer events.
- to give people or volunteer groups an easy way of recording their local river or stream including good things (wildlife sightings) and bad (pollution, litter and invasive plants).

Become a Citizen Scientist!

When you first sign up, you'll start by taking observational surveys, using the Westcountry CSI form. You'll be able to record information on plants, wildlife, river condition and any visible pollution. As long as you record a time and location you can fill in as much or as little of the form as you like.

Once you're up and running with the observational measurements, there is also the option to take some water quality measurements too – using some simple equipment that we can provide. At the moment, we are using turbidity tubes to measure how murky the water is, pocket-sized probes for dissolved solids, and a simple test kit for measuring phosphate.

When you've done your survey by the river add your data on the 'Cartographer' website and you'll then be able to see it on an interactive map alongside everybody else's surveys. It's totally flexible over how many surveys you do and where you do them. If you need any suggestions of where to do your testing, then get in touch and we can give you some pointers.

Westcountry Rivers Trust, Rain Charm House, Kyl Cober Parc, Stoke Climsland, Callington PL17 8PH.
Phone: 01579 372140 · Email csi@wrt.org.uk. Registered Charity No. 1135007 · Bringing Water to Life - Text WCRT12 £5 to 70070

Getting Started

1. Visit **wrt.org.uk/project/become-a-citizen-scientist** and send us an email **csi@wrt.org.uk** to let us know you're interested, and we'll send you a link to log on to Cartographer. This is where you'll submit your survey results. Feel free to look at other people's survey results by clicking on the points on the map.
2. Find one (or several) locations, which are safely and legally accessible, that you'd like survey.
3. Fill in the survey form, take a few photos and, if you have the kit, take your water quality measurements.
4. Upload your results to Cartographer.

CSI Water Quality Test Kit

Your Water Quality Test Kit will contain:

- Turbidity tube
- Insta-test Phosphate kit, with test tube
- Total Dissolved Solids (TDS) probe
- 12ml syringe
- Hand sanitiser gel

Using the Turbidity Tube

The turbidity tubes are very straightforward to use. There's a black and white 'Secchi disc' sticker on the bottom and a numerical scale up the side.

1. Fill the tube with water from the river (slowly to avoid creating bubbles) and watch as the disc becomes less and less clear.
2. The higher the concentration of sediment in the water the higher the turbidity and less water is needed for the disc to disappear.
3. At the point when the disc is no longer visible, read off the number on the scale on the side of the tube where the water level is and record your result on the form.
4. If the water reaches the top of the tube and the disc is still visible then record the result as less than 12 (<12), if the sticker is obscured before you reach the first number then record the result as greater than 240 (>240). If it falls between two values then record an estimated value somewhere in between.

TIP: If it's sunny, position yourself with your back to the sun so that the tube is in your shadow, also make sure you are not wearing sunglasses.

Insta-test Phosphate (low range 0 – 2500 ppb)

1. Rinse the syringe, and then rinse the test tube with the sample to be tested (fill halfway, shake and then empty).
2. Fill test tube to the 10ml line with sample water.
3. Remove one phosphate test strip from the bottle. Close bottle cap tightly after removing strip.
4. Gently bend strip in half (do not fold) with pads facing inward. Place test strip inside test tube cap.
5. Cap the test tube and invert slowly 5 times (invert the tube slowly to allow the bubble to go from the top to bottom and bottom to top).
6. Remove the cap and test strip.
7. Place bottom end of the test tube on the white boxed area of the colour chart. Look down through the OPEN test tube and compare to colour chart.
8. Dispose of the used strip responsibly (i.e. take it home and/or place in a litter bin).
9. The Cartographer online form currently asks for Phosphate in mg/l – the test strips give a result in ppb (parts per billion). When entering the results online divide the result by 1000, so 100 becomes 0.1, 300 becomes 0.3, 1000 becomes 1 and so on.

IMPORTANT: Avoid wet fingers inside the bottle. Store strips inside the home, away from extreme heat or sunlight.

TDS&EC (Total dissolved solids) probe

1. Remove the end cap to expose the sensor elements
2. Turn on the probe by pressing the 'ON/OFF' button – the display should read 0000 ppm with temperature shown in °C
   (if the display shows 'EC' or temperature in °F repeatedly press the shift button until the correct units are displayed)
3. Now immerse the sensor elements in the sample (this can be either directly in the river or stream, or from a suitable sampling container). **Do not immerse the probe beyond the line where the sensor cap fits – it is not fully waterproof!**
4. Once the temperature reading is stable (around 10 – 20 seconds) make a record of the numbers on the screen.

TIP: If you cannot read the screen with the probe in the water press the 'HOLD' button – this will hold the number on the screen while you remove the probe. Press 'HOLD' again to cancel.

Safety Guidelines

Before you leave:

- Make sure it's **safe** and **legal** for you to access the river or lake.
- Is someone going with you? If not, **let someone know where you're going** and when you'll be back.
- Do you have a **mobile phone** or way to call for help?
- Are you wearing the right **footwear**? Waterproof with good grip is best!
- Check the **weather**: you'll need sun cream, a hat and some water in hot weather, several layers of clothing in cold weather – and waterproofs if it looks like it's going to rain! Also consider whether recent heavy rain might have made river or riverbank conditions more dangerous.

When you arrive at the site:

- If the **water level** is too high or fast to allow safe sampling, you can always just do the observational measurements.
- Are you standing somewhere stable with **good footing**?
- Is there a **safe area** to complete the water quality tests, away from the water and other hazards such as livestock or traffic?

When carrying out the survey:

- The site you have chosen should enable a small sample to be collected **without the need to enter the watercourse.** If sampling from the edge, try not to lean over the water. Making a **milk bottle sampler** is a good way to take a water sample safely (see instructions to the right).
- Ensure that you **do not disturb the riverbed** when sampling as this will affect the sample.
- River water can contain **harmful bacteria** that can cause ill health and potentially serious diseases such as Weil's disease (also known as Leptospirosis). You should be aware of Weil's disease and, if you feel unwell, should mention it to your doctor. For this reason – and for sample integrity – try to **minimise personal contact with water** to be tested. By using a suitable sample container (see right) and the syringe provided there should be no need to immerse hands or fingers in the sample.
- **Do not carry out sampling with open cuts or wounds** and make sure to **wash hands** thoroughly between sampling and handling food. We supply a bottle of hand sanitiser gel for while you're out and about.

How to make a milk bottle sampler

1. Cut the top off a clean plastic 2 pint milk bottle, creating a large opening but leaving the handle intact.
2. Use two cable ties to tightly attach the handle to one end of a garden cane.

Thanks for getting involved with Westcountry CSI.

Any questions? Email csi@wrt.org.uk