

# CROWD: Clean Rivers Of West Dorset

## VISIT TO WESSEX WATER'S SALTFORD LABORATORY ~ 27TH FEBRUARY 2025

Huge thanks to Steve Parks for inviting us and for his talk and tour of the lab, to Jess Uren for organising the visit (and her work supporting our sampling/tests) and to Will Kirby for his help, support and bottomless knowledge.

### Highlights:

- Will talked about the **Fluidion Alert One**. He has ordered one (for a trial rental period). If the order is approved, he hopes to have it in the next few weeks, test it himself and then lend it to us to test for ourselves. In brief, it's a portable device that performs an *E. coli* test on a single sample with a result in 2-14 hours (longer time for lower levels). Consumables cost about £15 a go.  
This should be useful for us to try at different sites and in response to pollution/flooding events. Clearly, the single test capacity won't replace the multiple tests we're doing/planning on the Char or the Brit. It could be especially helpful on the Winniford and other sites, where regular tests are difficult or prohibitively expensive. It works with saline samples too, is sensitive at low levels and is not troubled by sediment.
- We discussed the use of **AI** to predict *E. coli* levels using historical and localised data from a range of non-bacterial results (i.e. temperature, pH, DO, turbidity and ammonia). This could be a workable approach for us in a couple of years, although it needs to be accompanied by actual *E. coli* tests to keep up-to-date with changes upstream. For example, if a faulty septic tank were fixed and stop spilling sewage into a stream, the AI wouldn't know that unless we told it.
- We discussed the value of continuing to measure **enterococci**. Like the EA, WW seems to think it's not worthwhile. But Will noted that enterococci survive and thrive in sediment and in daylight (*E. coli* does not). So sediment tests in the lagoons at Charmouth and Seatown (which would address Ian's question about whether they act as a 'sump') might benefit from continued enterococci testing. (Total coliforms are not part of the Bathing Water Framework and we have stopped counting them.)
- We discussed **PCR or other testing (mitochondrial DNA)** to establish the source of *E. coli* (ruminant, human, avian). Will stressed the cost and unreliability of these tests and said that a better and simpler approach would be walk-over surveys to find likely pollution sources. On septic tanks (harder to see problems if they are leaking into a culvert), he suggested a) looking for sewage fungus and b) using ammonia tests (Hanna) at regular intervals along streams and tributaries to bracket potential point sources.
- Will talked us through ways of distinguishing between **diatoms and sewage fungus**. Sewage fungus is present all year, is grey/white in colour, can look like rags or material and does not easily break up. Diatoms can have a yellow tinge, are only present in summer and disintegrate easily.
- Will said the **attrition rate for *E. coli*** in 'average' UK sunshine is as follows: the T90 value (time within which *E. coli* levels fall by 90% though solar UV radiation) is 12.5 hours in daylight. This makes it especially important to record UV levels as well as rainfall when we test the river.
- Wessex Water use a very similar **technique for measuring bacteria** to ours. John will adjust temperatures and cooking times very slightly to bring our procedures into alignment with theirs.

### Other takeaways:

- **Zinc and caffeine** are fed to pigs, so are not exclusively indicators of road runoff or human pollution.
- **High conductivity** is caused by high salt levels. In the right conditions (e.g. after roads have been salted, followed by rain) high conductivity may, therefore, be a good indicator of road runoff.
- We focus on **gastrointestinal** illness, but bathing in polluted water can cause eye/ear/respiratory infections.
- **Maize** doesn't need high phosphorus levels in the soil to grow well. Farmers may want/need to spread their slurry, but it's not a prerequisite for maize as is sometimes suggested.
- Several bacteria may cling to a single **sediment particle**. In the bacteriology tests that we do (filtration), these multiple bacteria are likely to show up as a single colony-forming unit. This might cause our *E. coli* readings to be lower than Wessex Water's when the water is turbid.