



PESTICIDE WATCH

Pesticide Watch is a nation-wide environmental monitoring program run by Deakin University which helps communities **identify pesticides in their local waterways**.

- **Collect a monthly water sample** following a simple step-by-step method and post them to our lab **at no cost to you!**
- Deakin University will be providing **ready-made kits** to participating groups which contain everything you need – all we need from you are samples once monthly.
- This research will go towards building a map which identifies where pesticide residues are located in Australian streams.

Be involved in cutting-edge science that will make a real difference!



Background


Freshwater streams unfortunately transfer of a massive number of potentially toxic substances through the environment. Among these substances, pesticides are perhaps the most harmful for biodiversity and human health [1]. Studies have shown us that a variety of classes of pesticides, but particularly insecticides, have a significantly negative effect on invertebrate biodiversity in these streams even at levels deemed as 'safe' [2,3].

However, there remains much uncertainty about the true ecotoxicity of pesticides in aquatic systems. For example, we have a limited understanding of the effects of chronic, low-dose exposure to these potentially toxic substances, and also the effects of this chronic exposure on successive generations [4,1]. In light of emerging research into pesticide ecotoxicity and new entry pathways for pesticides into streams, it is increasingly important to gather baseline data to gauge the true extent of this global environmental issue.

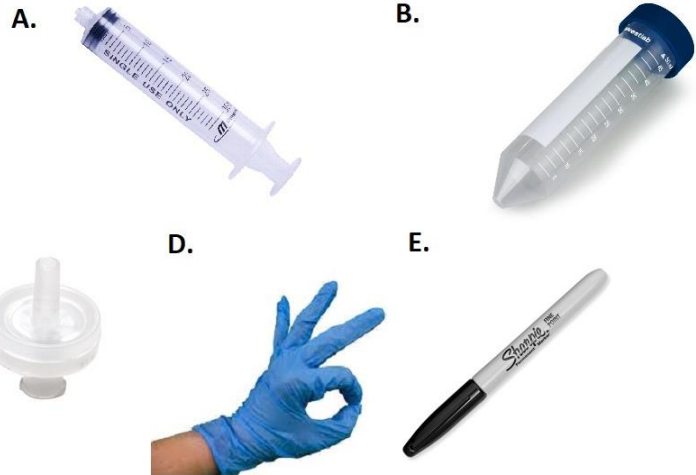
Quick facts:

- Over half of Australia's landmass is occupied by agriculture in one form or another, an industry which contributes substantially to the Australian economy [5].
- Since the 1990s, pesticide use in Australia has approximately doubled [6]. Additionally, new pesticide products are frequently emerging into the market today, further complicating the potential harm for freshwater ecosystems.
- Now-banned highly toxic legacy pesticides such as DDT are still being detected in Australia today[7], which contribute significantly to the overall ecotoxicity of pesticide residues in streams [1].

Despite the status of pesticides as among the most serious chemical contaminants in surface waters, to our knowledge there has never been a long-term baseline analysis of pesticide profiles for Australian streams. In this project, we will fill this knowledge gap with your help.



Kits contain the following equipment:



Right: A. 6 x 30 mL syringes, B. 6 x 50 mL collection tubes, C. 12 x syringe filters, D. nitrile gloves, and E. marker pen.

Monthly sampling protocol:

- Rinse a bucket or other container by lowering it into the stream, then emptying it. Repeat this rinsing of the container 3 times. Now collect some stream water.
- Rinse the syringe by filling it with the collected water and then discharging the water onto the ground nearby. Repeat this 2 more times.
- Fill a full syringe with collected water then screw the syringe filter onto the leur lock on the syringe.
- Prime the syringe filter by discharging approximately 1 mL of river water through it (do not collect this water)
- Discharge between 35-40 mL of filtered river water into a collection tube. If more water is needed, detach the syringe filter to aspirate more water before reattaching it to collect the sample.
- Label the samples with the date, location and replicate number (i.e. R1 and R2)
eg. 24/6/2023, Gardiners Creek Site 3, R1
- Freeze the samples when collection is complete.

Outcomes

The data that we will gain once we've processed the samples will be a positive or negative ID for the pesticides in our target list, and also for a substantial fraction of these targets we will be able to estimate their concentration. Once we've done this over the course of the year, we aim to produce a map showing pesticide profiles in different locations over time. A link to this map will be freely available to participants once completed.

We will also be trying to identify any relationships which might be linked to increased pesticide concentration in waterways – particularly rainfall, but also the other abiotic data that you obtain from your monthly testing (eg. pH, electrical conductivity, temperature, turbidity, nitrates, phosphates).

Our aim is for the data we obtain to be published in a scientific journal, and then a summary of our findings will be made into a report for all participants to access, including the significance of any important findings.

Our hope is that the data generated will be used to inform management practices around pesticide use in agriculture and at home.

If you know a school or group that would like to participate in monthly water sampling for our project in 2023, please get in touch!



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References

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