

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: Making agriculture more sustainable: understanding the impact of agriculture on waterway pollution

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Objective

This project aims to better understand the sources of agricultural nutrient pollution. We will use this understanding to advise industry partners about how to mitigate nutrient pollution in waterways agricultural areas.

Project Details

Better understanding the sources of nutrients that are transported by runoff from agricultural land is vital for protecting the cultural, environmental and economic values of both inland and coastal waterways. Nutrients may be transported offsite immediately after being applied to pastures as inorganic or organic fertilisers or following faecal deposition by animals. They may also be lost through soil erosion, or transported in dissolved form via both surface and subsurface pathways. This project will involve applying chemical and microbial mixing models to compare the contributions of different potential sources of nutrient pollution to waterways, under different climatic and discharge conditions. This will help understand both the sources of nutrient, and the conditions under which those sources are transported.

Determining the dominant sources of nutrient transported off irrigated farms will help inform the design of future modelling tools, and target mitigation efforts.

The successful applicant will join an existing multi-disciplinary project that involves researchers from Chemistry, Earth Sciences, Microbiology and Hydrology from Monash University and the University of Melbourne. The project is funded jointly by the Australian Research Council, the West Gippsland Catchment Management Authority, DELWP, Gippsland Water and Agriculture Victoria. In this project, we work closely with our industry partners, key stakeholders (farmers) in our study catchment.



Source: Alexis Killoran, Macalister Demonstration Farm

Prerequisites

Familiarity with data analysis software packages (e.g. R, MATLAB, Python) is beneficial but not essential.

A keen interest in water resources research and industry-relevant research is essential.

Additional Information

The successful applicant will be asked to conduct desktop modelling, statistical analysis, field work and lab work. The field work will involve travel to Gippsland with project team members (potentially overnight trips) for sampling campaigns.