Project Summary 2018-19

Understanding the interactions between groundwater, surface water and Groundwater Dependent Ecosystems (GDEs)

Project B4:
Groundwater

This project will help Melbourne Water identify GDEs that could be at imminent risk of contamination, as well as provide guidance on the selection, design, scale and location of stormwater control measures to mitigate the risks of adverse outcomes on groundwater flow and quality.

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This project will increase our understanding of the interactions between groundwater, surface water and Groundwater Dependent Ecosystems (GDEs) in key locations across the Port Phillip and Westernport region. In particular, it will seek to quantify the age and transit time distribution of ground- and surface waters. This new information will help identify GDEs that could be at risk of contamination, particularly those where water travel times are very short.

In the first year, the project will focus on the impact of stormwater infiltration on groundwater quality and flow paths. This work is funded through an existing Australian Research Council Discovery project and substantial inkind contributions from the University of Melbourne, as well from the Partnership Core funding (joint core investment from University of Melbourne and Melbourne Water).

Methods

The project will examine the fate of infiltrated stormwater in the urban context, including examining its impacts on water quality and the potential for flushing groundwater pollutants into surface water.

This research two main components:

(i) development of a GIS-based risk assessment framework, using the DRASTIC framework; this work is led by Heather Graham (Melbourne Water) and supported by an informal collaboration with Peter Dahlhaus from Federation University.

(ii) a combined field and laboratory-based study, using the Wicks Reserve bio-infiltration basin as a case-study site. At this site, the project will measure the migration of pollutants between the basin and the receiving water, quantifying the influence of the basin on groundwater levels, along with evapotranspiration by nearby trees. Laboratory-based columns will then be used to better understand the mechanisms at play, so that the field results can be extrapolated more broadly.

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