

How can retention, use and treatment of urban stormwater protect or provide natural flow regimes for waterway health?

Urban
Flows
Project C1

This project will influence stormwater management policy, support delivery of Healthy Waterways Strategy objectives for stormwater management and delivery of environmental flows.

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Melbourne Water's Healthy Waterway Strategy has assumed that stream protection, and potentially restoration is possible through catchment-based stormwater control measures (SCMs).

This project aims to test this assumption by asking if stormwater runoff from urban developments can be adequately retained, used and treated to protect or restore stream ecosystem structure and function, which is degraded by urban development with conventional stormwater drainage.

This project will be delivered through three complimentary sub-projects:

1. Sunbury

The major component of this research will be undertaken in association with the Sunbury IWM project. If successfully implemented, IWM should be sufficient to protect (and likely restore) both the small tributaries and the larger receiving waters downstream, as it will achieve the primary principles of stormwater management for stream protection.

This project seeks to establish a monitoring program to permit effective assessment of contrasting development approaches and further understand the role and ecosystem structure and function of small ephemeral tributaries around Sunbury which remain poorly understood.

2. Little Stringybark and Dobsons Creek

This sub-project seeks to determine if the ecological structure and function of several peri-urban streams can be restored via the catchment scale application of dispersed stormwater control measures (SCMs).

Over eight years beginning in 2009, 620

dispersed SCMs projects (lot and precinct scale) were constructed across two peri-urban catchments, treating runoff from 4 km² of urban development. The project included extensive monitoring (now highly reduced) of stream hydrology, water quality, macro invertebrates, diatoms, algal mass and organic matter decomposition. Data analysis and modelling of this large 20 year dataset is in progress.

3. Multi-scale real-time rainwater

This sub-project focuses on the application Real-Time Control (RTC) technology which offers the potential to revolutionise the way small-scale, highly distributed SCMs operate.

It will test the technical and social feasibility of operating distributed, co-managed, stormwater control measures using real-time control, to improve the hydrology and ecological health of urban streams. This will be achieved through a major experimental intervention in Monbulk Creek.

Expected Outcomes

- Inform the policy and standards for stormwater treatment in new urban developments.
- Clarification of the critical assumptions in the HWS MERI on the benefits of higher levels of stormwater treatment during/for urban development.
- Understanding of minimum intervention requirements for stormwater to affect a change in stream hydrology and water quality.
- Understanding of the potential benefits, limitations and practical application of Real-time Control technology for flood mitigation.
- Improved understanding of ephemeral stream structure and function.