

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

### Project C1: Urban Flows

This project will influence stormwater management policy; support delivery of Healthy Waterways Strategy objectives for stormwater management and environmental flows; and inform management of flood mitigation, urban microclimate and resilience to climate change.

#### Project Team:

*University of Melbourne*

Chris Walsh

Tim Fletcher

Chris Szota

Sam Imberger

Matt Burns

Peter Poelsma

Gen Hehir

Rob James

Mike Sammonds

Stephanie Lavau

*Melbourne Water*

Tiana Preston

Belinda Lovell

Marion Urrutiaguer

Alison Rickard

Micah Pendergast

Katrina Hawkins

Andrew Grant

Birgit Jordan

Virginia Harris

Beth McLachlan

Rhys Coleman.

Melbourne Water's new 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.

The Little Stringybark and Dobsons Creek project, has demonstrated improvements in flow and water quality regimes, and tentative indications of some ecological improvement in streams in response to sufficiently intensive catchment-based SCMs.

This project aims to build on that work, continuing assessment of response in those streams, and expands to new catchments in which the limitations of insufficient space (for stormwater control measures) and demand (for harvested stormwater) are likely to be overcome.

The project also expands, through two sub-projects, to investigate specific stormwater control techniques, including (i) real-time control rainwater harvesting systems, focussing on the Monbulk Creek catchment, and (ii) novel stormwater storage systems incorporating street trees, focussing on the western urban growth area.

#### Methods

The primary new location is the eastern part of the Sunbury growth area for which a large integrated water management (IWM) project is proposed. This project is planning on maximising large demands for harvested stormwater, which provide potential for restoration of flow- and water-quality-regimes that are predicted to be adequate for the protection of the small ephemeral tributaries draining the development, and its main receiving water, Emu Creek.

A monitoring program is proposed to establish background data on stream structure and function to permit robust assessment of the effects of the development and its IWM system, when it is established over the next 5 years. The first year will involve establishment of a monitoring network and pilot studies of methods for monitoring small ephemeral tributaries.

Other studies to be included in the project, as integrated sub-projects, include:

- Little Stringybark Creek: ongoing hydrologic and water quality monitoring.
- Real-time-control rainwater harvesting systems: testing a network of remotely controlled tanks for provision of environmental flows.
- Smaller-scale assessment of SCM performance: testing alternative streetscape designs for street trees that retain runoff and support expansion of the urban forest.