Project Summary

W11 Real-Time Control: Application of real-time-control technology to the management of stormwater

Objective(s)

To test and develop applications of real-time control (RTC) technology to the management of urban stormwater, enhancing Melbourne Water's ability to protect waterways and deliver more sustainable and liveable urban landscapes.

Why this research is important

The advent of real-time control technology has been well-documented over the last few years, along with its potential to improve the management of urban stormwater. This potentially covers everything from improving the performance of individual stormwater control measures, through to creation of new smart networks, allowing a whole range of 'new actors' to participate in the management of the urban water cycle.

However, simply 'imagining' such a future will not deliver it. There is a need to undertake rigorous testing of the performance of RTC to deliver improved performance of assets. Even more ambitiously, there is need to create and test (in the real-world), new business models and approaches that exploit the capability of RTC to facilitate contributions to individuals.

The project is made up of three workstreams (WS), each funded through existing Australian Research Council (ARC) projects for which Melbourne Water is an industry partner:

WS1: Activating lazy stormwater wetlands through real time monitoring & control.

WS2: Can real-time control deliver environmental flows to protect urban streams and Platypus?

WS3: Making optimal use of stormwater in cities: a market-driven smart-grid.

Contribution to Key Research Areas

- Stormwater management and flooding
  Developing improved technologies and systems to support stormwater harvesting and re-use.

Achievements to date

- Development of IT control platforms and cross-industry integration of communication and control systems, including an algorithm for controlling water storages. (WS2)
- Ongoing assessment of platypus ecology, including assessing general habitat use and monitoring the impacts of different flow regimes. (WS2)
- Collaboration with industry partners (South East Water and Yarra Valley Water) to allow the market-based grid to be tested in a range of conditions. (WS3)
- Multiple real-time control events run at the Troups Creek Wetland by Monash University collaborators, including water quality sampling. (WS1)
- Development of a Tanks User Interface, providing information to participating community members. (WS1)

Approach for year 3

A primary focus of each work stream is:

- W1: Trial wetland mesocosm experiment at Burnley Campus.
- W2: Installation of the network of smart stormwater retention systems (tanks and lakes) in Monbulk catchment.
- W3: Preliminary experimental trials on the use of financial incentives to encourage participation of residential tank owners (e.g. manual release of water).

Key outputs for year 3

- Hydraulic model for the Monbulk Creek catchment (W2&3)
- PhD Thesis on platypus in Monbulk Creek and the impact of flow regime (W2)
- Construction of a harvesting and synthetic stormwater mixing facility, designed to deliver stormwater to wetland mesocosms. (W1)

Expected benefits

- An understanding of how a real-time controlled network of rainwater tanks and large online storages can be used to optimize the flow regime.
- Knowledge on how to improve wetland quality treatment performance, by optimizing their maintenance and operation.
- Knowledge of the potential of a Smart Rainwater Grid – where rainwater tank owners would be financially rewarded for their contributions to alleviation of flood risk and supply of environmental flows.

For more information

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