

A1.2 Indicators and approaches to monitor the performance of stormwater wetlands.

Background

Stormwater wetlands are designed to assist in the management of flows, treatment of nutrients, and detention of sediments and toxicants in urban areas. They require major investment from Melbourne Water (MW) and associated Councils and need to be managed appropriately to ensure long term performance is maintained and the health of downstream waterways is protected.

Approach

This project aims to:

- Undertake an international literature review to identify what toxicants typically accumulate in stormwater wetlands and how they affect wetland performance and management
- Conduct surveys in stormwater wetlands across Melbourne to determine what toxicants are present in local stormwater wetlands and where they are accumulating through the treatment process
- Review traditional and emerging methods for monitoring wetland 'ecological health' and develop simple, cost-effective monitoring tools to determine the effects of toxicants on wetland performance

This is a collaboration with Melbourne Waterway Research-Practice Partnership (MWRPP) Project B2.



Progress to date

The literature review is nearing completion and toxicant screening has been carried out at 23 stormwater wetland sites. Initial results indicate that metals (Zn, Cu, Ni and Pb) as well as TPH and synthetic pyrethroid pesticides were commonly present in inlet sedimentation ponds. There was no correlation between toxicant concentration and wetland age. Further sampling will occur throughout other areas of each wetland (i.e. macrophyte, outlet zone), to understand if toxicants are accumulating in specific areas. Particle size analysis will be used to help understand this, and novel molecular tools will be developed to determine the impact of toxicants on microbial composition and function.

Expected Outcomes

- Improve our understanding of the maintenance requirements of stormwater wetlands to ensure adequate asset performance
- Inform improved design of stormwater wetlands that is likely to result in better asset performance and reduced maintenance requirements
- Inform the development of a cost-effective stormwater wetland asset performance surveillance program for Melbourne Water

Project Team

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Expected Completion 2023

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