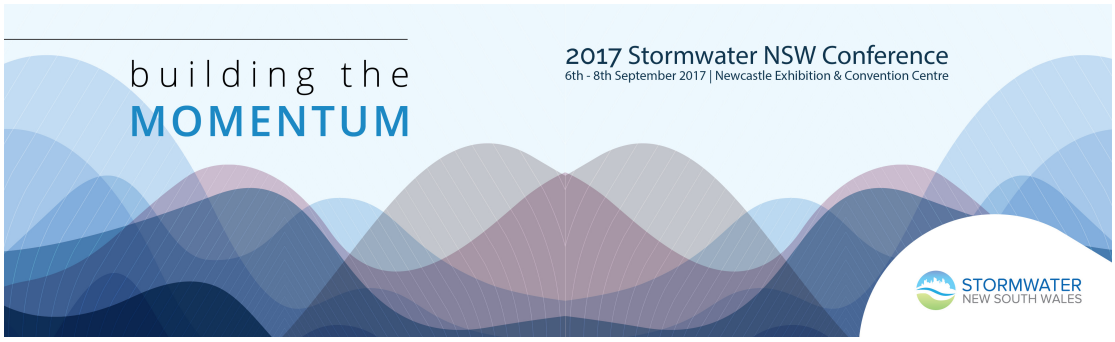

Can We Borrow Lessons From Ecological Monitoring to Better Understand the Maintenance Requirements of our Stormwater Quality Improvement Devices?

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Stormwater quality improvement devices (SQIDs) (e.g. bioretention systems and gross pollutant traps) are installed in urban catchments to prevent pollution from entering and degrading our water environments. These devices have been installed as part of land development and retrofit projects around Australia to improve stormwater quality for over a decade now.

Despite the widespread implementation SQIDs, reliably forecasting their maintenance requirements remains a challenging task for asset managers, including many Australian local governments. Typical approaches have involved consulting proprietary manufacturers and their operation and maintenance manuals (e.g. for gross pollutant traps), or industry guidelines (e.g. for bioretention systems, Water by Design, 2014), all of which provide generalised guidance rather than specific instructions on how to evaluate the maintenance needs of individual devices.

A consequence of these approaches is the allocation of maintenance funds that are:

a. based on generalised and/or limited information about devices; and
b. often insufficient for meeting their maintenance needs and thus ensuring the delivery of their important environmental and other benefits (e.g. reduced waterway pollution and improved amenity in communities).

This presentation will demonstrate how applying practices from effective ecological monitoring (Lindenmayer & Likens, 2010) to the monitoring efforts of SQIDs may help improve our understanding of the maintenance needs of this type of infrastructure and address some of the issues described above.

These practices include:

1. setting targeted questions;
2. using these questions and a conceptual model of how devices work to guide data collection;
3. building mutually beneficial relationships between scientists, policy-makers, and asset managers; and
4. using monitoring data frequently and improving upon monitoring through time.

The presentation will provide an example of how the above practices can be used to better understand the maintenance needs of gross pollutant traps, including the modelling of clean and inspection requirements and costs. It will also demonstrate how monitoring can be completed cost-effectively during routine maintenance

activities within an automated online asset management system.
The results of this approach include the forecasting of SQID maintenance requirements that are:a. based in high quality real-word data; b. modelled using an underlying statistical methodology; and ultimatelyc. more reliable for informing maintenance budgets and thus ensuring delivery of the important environmental and other benefits of SQIDs.
References:
Lindenmayer, D. B., & Likens, G. E. (2010). The science and application of ecological monitoring. Biological conservation, 143(6), 1317-1328.
Water by Design. (2012). Bioretention technical design guidelines. Healthy Waterways Ltd, Brisbane, QLD.