Wetland treatment systems for nitrogen removal: a synthesis

How much nitrogen do treatment wetland systems remove?

What features do treatment wetlands need to maximise nitrogen removal?

How cost-effective are wetland treatment systems for nitrogen removal?

Wetland treatment system synthesis project

A new project has just begun to synthesise results from wetland treatment system trials throughout Queensland, to provide answers to these questions. It also aims to increase understanding of the capacity and cost-effectiveness of wetland treatment systems in removing nitrogen from run-off and wastewater.

Why is this project needed?

A whole of system approach to improving water quality is essential to maintain healthy aquatic ecosystems and reducing nitrogen inputs to waterways is a priority in many Queensland catchments. Wetland treatment systems, including treatment wetlands, vegetated drains and landscape wetlands have the potential to remove nitrogen from land run-off or wastewater prior to discharge. Their adoption has been limited by a lack of rigorous published information on performance and cost-effectiveness.

In recent years, numerous wetland treatment systems have been monitored to assess their role in water quality improvement. These projects, funded by the Queensland Reef Water Quality Program, National Environmental Science Program (NESP) and utilities companies, have generated considerable data to fill this knowledge gap. This information is in various formats, in different reports, some of which are not publicly available. Collating and synthesising this information will help to identify the nitrogen removal capacity of wetlands in different contexts (land uses, climates) and the key factors that affect nitrogen removal.

Figure 1 Treatment wetland in the Barratta Creek catchment, North Queensland. Source: QLD Government

There is also a need for robust information on the cost-effectiveness of wetland treatment systems, to compare to other nitrogen reduction practices. Collating nitrogen removal performance and cost information will produce synthesised information to inform policies such as offsets and help industries and utilities assess options to meet water quality requirements.

Figure 2 Landscape wetland in the Tully catchment. Source: AWC and Terrain NRM.

What will be delivered?

The project will synthesise information from wetland treatment systems in the Great Barrier Reef catchment and South-East Queensland. This includes treatment wetlands, landscape wetlands and vegetated drains on farms and wetlands for wastewater treatment as part of sewage treatment plants.

A peer-reviewed journal article or report will be published, covering:

- treatment performance
- factors influencing nitrogen removal
- cost-effectiveness of wetland treatment systems
- key messages to inform future on-ground implementation of wetland treatment systems, policy, and investment,
- a list of remaining knowledge gaps in wetland treatment systems nitrogen processing.

This information will be used in communication and extension products, including updates to conceptual models and treatment system information on the Wetland*Info* website.

Who is involved?

The project is led by the Department of Agriculture and Fisheries (DAF), in collaboration with Griffith University, the Wetlands Team and Office of the Great Barrier Reef (OGBR) in the Department of Environment and Science (DES), and is funded by the Queensland Reef Water Quality Program.

Natural Resource Management (NRM) organisations, utilities companies, consultancies and other universities are contributing by providing water quality and cost information from their wetland treatment systems.

For more information

For information on treatment systems visit wetlandinfo.des.qld.gov.au/wetlands/management/treatment-systems/

The Queensland Wetlands Program supports projects and activities that result in long-term benefits to the sustainable management, wise use and protection of wetlands in Queensland. The tools developed by the Program help wetlands landholders, managers and decision makers in government and industry. The Queensland Wetlands Program is currently funded by the Queensland Government.

Contact wetlands@des.qld.gov.au
or visit www.wetlandinfo.des.qld.gov.au

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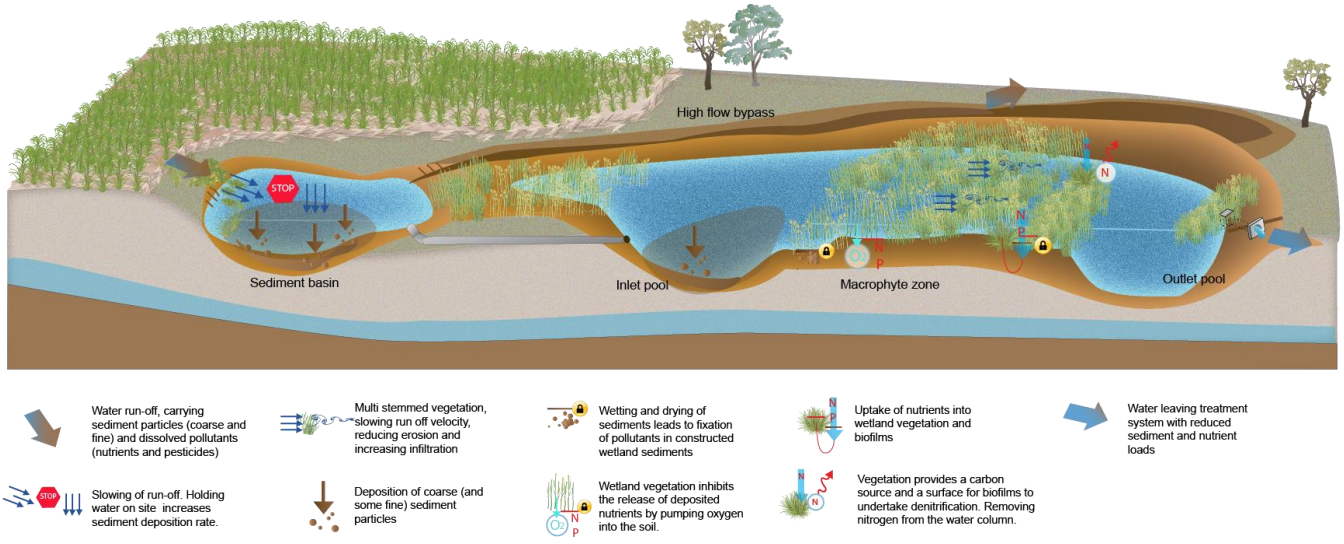

Figure 3 Features of a treatment wetland. Source: WetlandInfo