

BIOREACTORS IN THE GREAT BARRIER REEF (GBR) CATCHMENTS: IMPLEMENTATION AND NETWORKING

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Intensive agricultural production can have adverse water quality impacts on aquatic ecosystems. Declining water quality associated with land-based run-off has been identified as a key risk for Queensland's World Heritage Listed Great Barrier Reef (GBR). In 2015, the Australian and Queensland governments released the Reef 2050 Long-Term Sustainability Plan (Reef Plan) to provide an overarching framework for managing the GBR. The Australian and Queensland governments have invested in water quality improvement projects and research across the state to reduce sediment, pesticides and nutrients entering the GBR Marine Park. However, despite investment into improved agronomic strategies and adoption of Best Management Practice (BMP); Reef Plan water quality targets for Dissolved Inorganic Nitrogen (DIN) are unlikely to be achieved. This highlights the need to consider the role of edge-of-field mitigation, to reach the ambitious targets for DIN entering the GBR. Denitrifying bioreactors have been identified as a potential treatment system option for reducing nitrate pollution from agriculture in the GBR lagoon. Until pilot research in 2015, bioreactors as an edge-of-field mitigation tool remained relatively unexplored in Australia. Woodchip bioreactors are currently being trialled in a number of GBR catchments. The aim is to test their efficacy in differing climates and agricultural production systems to identify opportunities and constraints for the use of bioreactors. This presentation discusses the management approach of bioreactor installations in GBR catchments and how Queensland has navigated a uniform approach to the design, construction and monitoring of a range of bioreactor installations. It unpacks how a network of seemingly disparate entities have come together to advance bioreactor research in Queensland and raised the profile of bioreactors as a nitrogen mitigation option. In 2020, the Network will produce the first installation and monitoring guidelines for bioreactors in tropical regions, pioneering a coordinated approach to research, development and extension across organisations.

Editor's note: *An extended manuscript has not been submitted for this presentation.*
