

Reducing the impacts of waste water from intensive horticulture on waterways

COUNCIL NAME

Coffs Harbour City Council

WEB ADDRESS

chcc.nsw.gov.au

SIZE

1,174 km²

POPULATION

76,551

Overview

Coffs Harbour City Council collaborated with Southern Cross University to quantify community concerns over declining water quality due to rapidly expanding intensive plant agriculture in the area. This led to new knowledge being created about the detrimental effect uncontrolled fertilizer can have on local waterways. Council was able to use this information to develop woodchip bioreactors to capture and treat nutrient-rich wastewater from blueberry farms and cucumber hothouses. The project has led to a reduction of pollution in waterways, savings in fertilizer costs for local farmers, and building stronger relationships between council, local grower cooperatives and industry groups.

Background

Replicability/Leadership

The Coffs Harbour Local Government Area (LGA) has seen a rapid increase in the area of rural land under intensive plant agriculture (IPA - blueberries, raspberries, blackberries, hothouse cucumbers and tomatoes). This rapid intensification of land use has been implicated in declining water quality and increased pressure on water resources, with many complaints from the community regarding water pollution from agricultural run-off, with fertilisers and pesticides of concern. The coastal waterways of the Coffs Coast discharge into the Solitary Islands Marine Park, prompting community concerns over the impacts of agricultural pollution on marine life.

Objectives

The key objectives of the project were to:

- Identify the type of water pollution originating from IPA, non-IPA and control sites, and how it relates to catchment area and land use type
- Replicate the studies across different catchments extent and severity of pollution
- Implement management recommendations in an experimental capacity on selected IPA properties with post-works monitoring
- Communicate the results to growers, Industry and land managers.

Implementation

Council collaborated with Southern Cross University's National Marine Science Centre, based in Coffs Harbour, providing some funding to conduct a series of studies as follows:

- Initial study to quantify nutrient levels from blueberry farms, grazing properties and control sites entering Bucca Bucca Creek
- A follow-up study to investigate nutrient and heavy metal levels from a coastal catchment with high intensity land use from IPA adjoining the Solitary Islands Marine Park
- A study looking at the nutrient pollution from 11 different Coffs Coast catchments with various levels of IPA
- A study on the effectiveness of the experimental woodchip bioreactors for treatment of nutrient-rich wastewater (in progress) SCU provided reports to Council containing management recommendations.
- Recommendations were distributed to all stakeholders including Councillors, the Blueberry Interagency Working Group, Horticulture field days hosted by Landcare and the Orara River Rehabilitation Project to target farmers.

On-ground works on selected IPA properties were planned in collaboration with SCU, LLS, and local Landcare groups, and four experimental woodchip bioreactors to treat the nutrient-rich run-off wastewater were constructed. The key aims of the on-ground works are to:

- Treat nutrient rich wastewater to a level acceptable under current environmental water quality guidelines before discharge to waterways through development of a cheap, simple to construct woodchip bioreactor
- Educate farmers on appropriate fertiliser and pesticide application rates and methods to reduce water pollution
- Inform Government and Industry on current pollution levels of wastewater from IPA
- Encourage better land-use planning and site establishment at Government and local level
- Educate Industry and growers on best practice site establishment and nutrient management.

The project is ongoing at this stage, with further study results due later in 2020. Investment since January 2019 has been \$70,000 provided to SCU through the Environmental Levy program for the studies, which has been matched by SCU, and \$50,000 for on-ground works, supplemented by funding from LLS.



Outcomes

The project has achieved the following:

- all SCU studies found a clear link between intensive plant agriculture (IPA), nitrogen runoff and increased sediment loads in streams.
- All studies recommended improved management of sediment erosion and fertilizer use to prevent environmental changes in downstream waterways, including the Solitary Islands Marine Park.
- The loss of nutrients from IPA can lead to eutrophication (excess nutrients in water leading to algal blooms and very low oxygen) and decreased water quality.
- Estimates indicate growers are losing between 18 and 25% of fertiliser applied to the waterways.
- Nutrient loads in rain were 695 times greater than in the dry period. These nutrient loads were amongst the highest reported for catchments on the Australian east coast, and similar to loads in rivers throughout China, Europe and India with strong agricultural or urban influences.
- Sediment chemistry analysis indicates a large increase in sediment loads on waterways since the changeover from bananas to blueberries in coastal catchments.
- Soils chemistry analysis on operational IPA indicates a suite of pesticides, not always approved for use on the crop grown, are persisting in soils.
- In response to the study results, four experimental nutrient woodchip bioreactors were installed on IPA properties to trial capture and treatment of nutrient-rich runoff. These structures are being monitored currently for effectiveness with results due later in 2020.

Study results were distributed to industry, government, Councillors, IPA farmers, made available on the website, and presentations were held. Key messages provided were:

- Farmers need to reduce fertiliser application
- Waste water and surface run-off should be captured and treated before discharge to waterways
- Current government and industry guidelines on fertiliser and pesticide use need revision.

The study results were initially met with criticism from industry, government and growers. However, the farmers whose properties have been worked on through the project immediately reduced their fertiliser use, saving money as fertiliser is their second biggest expense after labour. Once subsequent studies were released, which have since been published in peer-reviewed journals, there was better acceptance of the issues, which has led to a good working relationship with industry groups, and NSW Department of Primary Industries has revised its guidance on fertiliser application rates. SCU is continuing to investigate impacts of IPA in the LGA, and Council hopes to continue to drive improved management practices in the IPA sector and better land-use planning.

Key Learnings

Council has learned that the concerns voiced by the community for many years over the impacts of a rapidly expanding IPA sector needed investigation, and that there needs to be improved land management and farming practices to reduce these impacts. However, Council has also learned that with good planning, well set-up IPA operations, and good guidance, IPA can have minimal environmental impact.

The lack of planning controls currently in place in NSW for IPA means that this can only be done voluntarily with support from industry and farmers, and there is a lack of good guidance on ideal IPA establishment and management. The project has identified some of the issues with IPA and declining water quality, which has allowed Council's Environmental Health section to better work with IPA farmers who have issues with their operations. It has also stimulated more collaboration with industry and other involved government agencies such as the Natural Resource Access Regulator (NRAR).

Council continues to support further research with SCU to allow better management options for IPA to be developed and trialed with our local growers. As results to date and feedback from involved growers has been very positive, Council anticipates that further industry change to minimise impacts of IPA will be achieved, with the ultimate aim of a profitable IPA industry with minimal environmental impacts.

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This project was the 2020 winner of the Natural Environment Protection & Enhancement: On-Ground Works Award at the LGNSW Excellence in the Environment Awards