



# Mackay Whitsunday Isaac Regional Science Forum

Overview of the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program  
Current Status of Programs and Program Components

Dr Shaneel Chandra

Chief Scientific Officer, Office of the Great Barrier Reef.



Australian Government

Department of Climate Change, Energy,  
the Environment and Water



Queensland  
Government

# Structure of Presentation

**Water Quality Improvement Plan**

**Paddock to Reef Program**

**Program and Program Subcomponent Reviews**

**P2R Major (5-Year) Review and Redesign**



**Australian Government**

**Department of Climate Change, Energy,  
the Environment and Water**



**Queensland  
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# Threats to the Great Barrier Reef



Climate  
change



Land based  
run-off



Coastal  
land use  
change



Direct  
use



## Targets

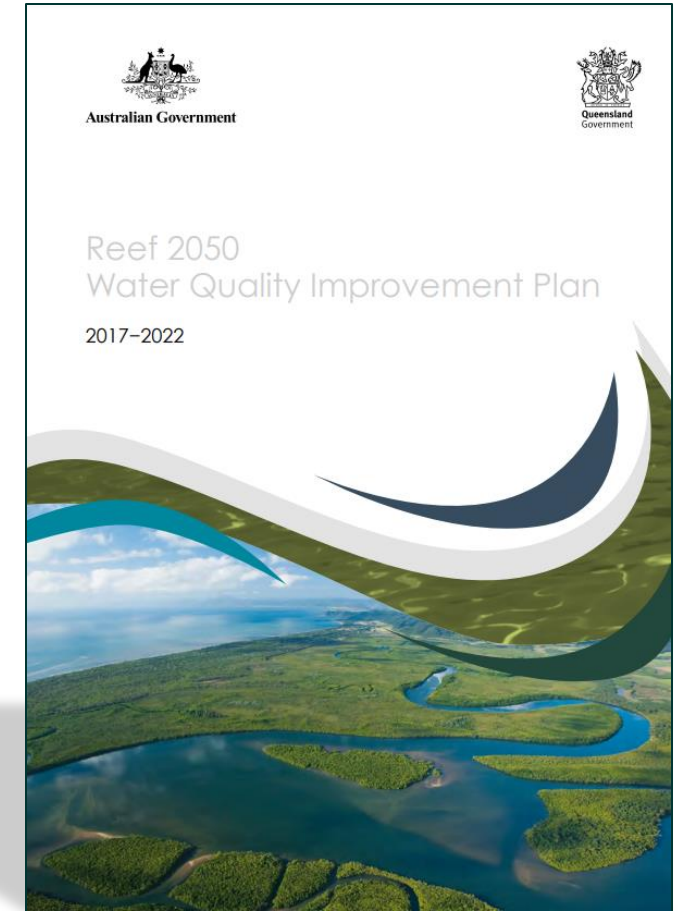
- Nutrients
- Fine sediments
- Pesticides

# The Water Quality Improvement Plan



# The Water Quality Improvement Plan (WQIP)

- A guide for industry, government and the community to work collectively to improve the quality of water flowing to the GBR.
- Uses independent and peer-reviewed science.
- Who tracks the improvement in water quality?
  - Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef, P2R program)
- The Plan is currently under review – *next presentation*.



# Ecologically Relevant Targets



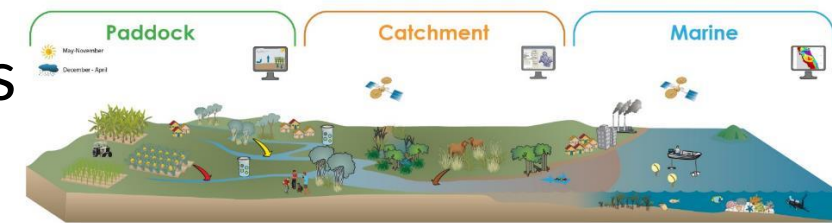
Photo source: Article – GBR not bouncing back as before, but there is hope, University of Queensland, July 2018



Photo source: Article – What is seagrass?, Explainers, Great Barrier Reef Foundation, December 2021

# The Paddock to Reef Program

- Launched in 2009
  - Unites more than 20 industry bodies, government agencies, NRM bodies, landholders and research organisations.
- Jointly-funded by the Australian and Queensland governments.
- Reports progress towards 2050 WQIP targets, objectives and outcome.
- Monitoring and modelling across various attributes





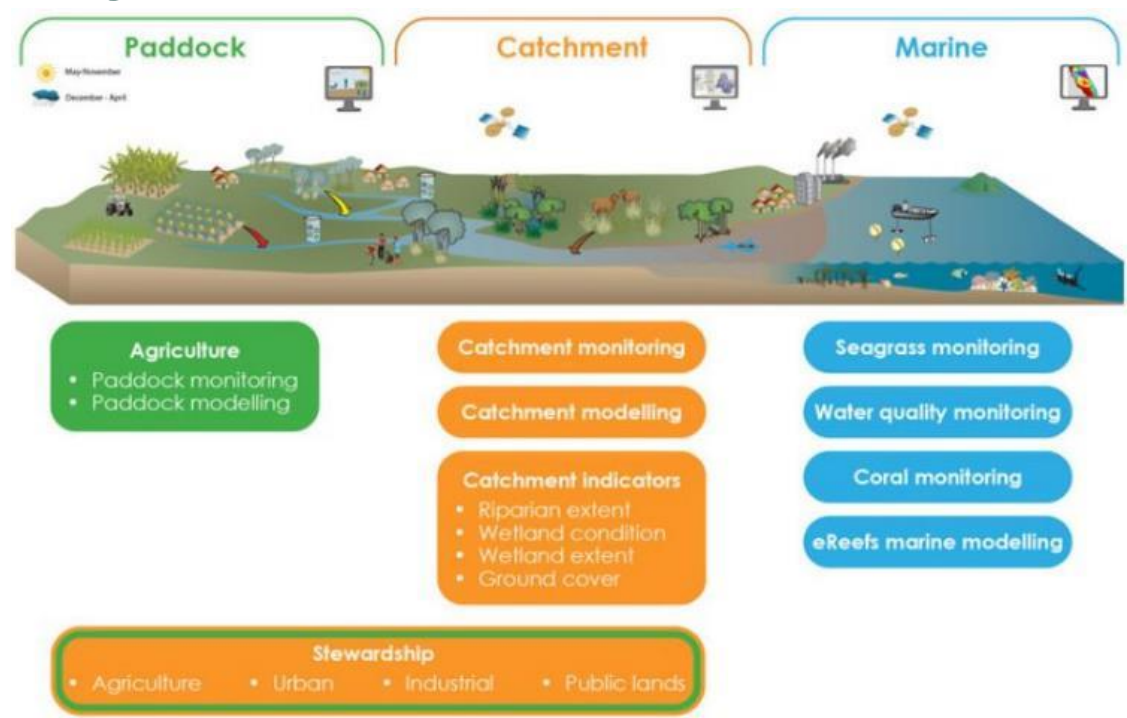
# The Paddock to Reef Program

- The program provides information that enables partners to **evaluate, prioritise** and continuously **improve the effectiveness** of Reef 2050 WQIP and Reef 2050 Plan implementation.
- **Integrates monitoring and modelling** from the paddock to reef scales.
- **Strong management–science interaction.**



# The Paddock to Reef Program

## Reef Science Coordination, Synthesis and Integration



Thursday, January 30, 2025  
Mackay and Whitsunday Life

### Reef Trust Landscape Repair Program Unveils \$26 Million Initiative To Curb Sediment Runoff And Protect The Reef

Reef Catchments will lead the delivery of the Mackay Whitsunday Island (MWS) Landscape Repair Program, investing \$26 million in water quality initiatives aimed at reducing 18 kilotonnes of fine sediment runoff into the Great Barrier Reef lagoon by June 2030.

The program will prioritise investment in local contractors, companies and stakeholders to build a consortium of delivery partners working effectively to improve local water quality. This includes prioritising First Nations connection to priority landscapes by supporting processes of First Nations-owned and operated businesses, and providing a contribution to positive environmental, social, and economic outcomes for the MWS region.

The Reef Trust Landscape Repair Program represents a scaling-up of remediation investment and is part of the Australian Government's \$3 billion dollars investment to accelerate actions to support the GBR's long-term resilience and protect its future.

HOME / NEWS / THE MACKAY IRRIGATION PROJECT, A ...

PROJECT NEWS - 13 AUGUST 2024

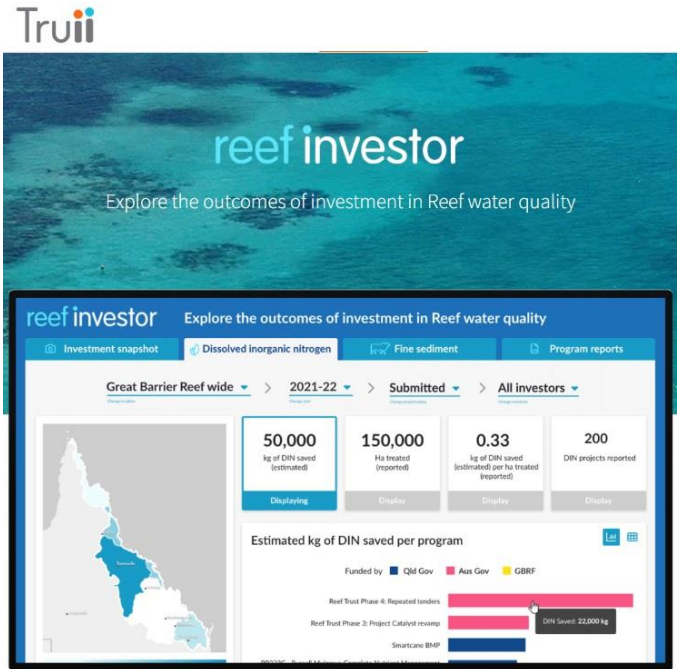
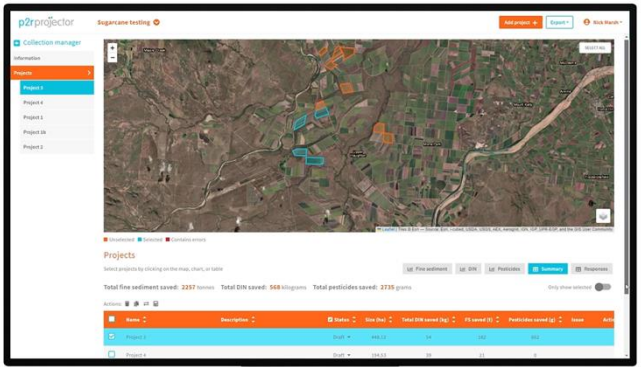
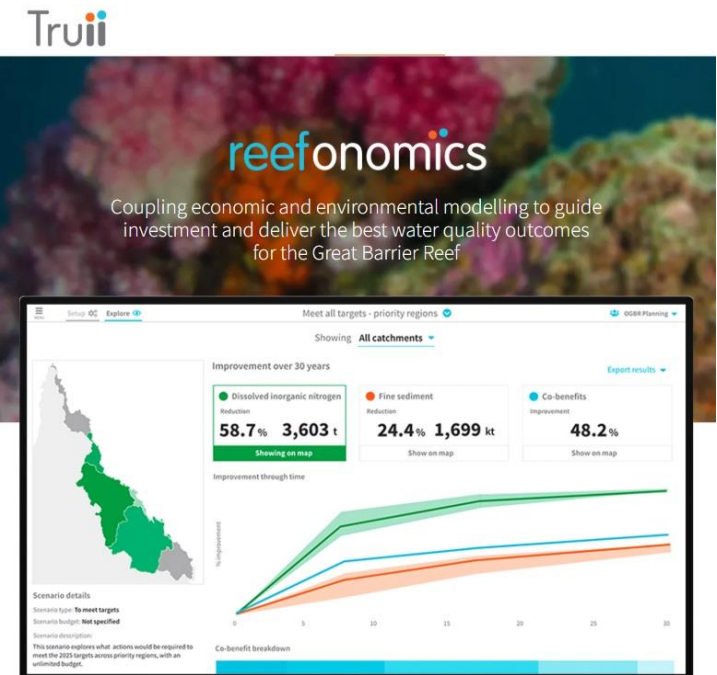
### The Mackay Irrigation Project, a win for growers and the Reef

Improved irrigation efficiency boosts regional productivity and nutrient use efficiency.

### Fitzroy Water Quality Program

Preventing 56 kilotonnes of fine sediment from the Fitzroy River basin from entering the Reef's waters every year.

# Tools of the Trade in the Paddock to Reef Program



# Program and Program Subcomponent Reviews

- Catchment modelling program
- Regional Report Card Partnerships
- Agricultural land management practices and human dimensions (behavioural science) programs
- Catchment loads monitoring
- Wetland condition monitoring
- Whole of program review and redesign



# Paddock and Catchment Modelling Program Review (May 2024)



Australian  
National  
University

## PADDOCK AND CATCHMENT MODELLING PROGRAM REVIEW

REVIEW TEAM REPORT 31/05/2024

By: Jakeman, Tony (Chair), ANU; Snow, Val, AgResearch, New Zealand; Verburg, Kirsten, CSIRO;  
Western, Andrew, University of Melbourne; Whitehead, Paul, University of Oxford; Elsawah,  
Sondoss, UNSW

### Review Panel Members

- Tony Jakeman (Chair), Australian National University (ANU)
- Val Snow, AgResearch, New Zealand
- Kirsten Verburg, CSIRO
- Andrew Western, University of Melbourne
- Paul Whitehead, University of Oxford
- Sondoss Elsawah, UNSW



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Sondoss, UNSW

### Methodology Used

- Conducted over 10 days in April 2024.
- Assessed progress on recommendations from 2012, 2015, and 2019 reviews.
- Evaluated recent model developments, methods, and alignment with Program objectives.
- Identified gaps, emerging issues, and opportunities for improvement.
- Reviewed published papers, draft reports, data inputs, and stakeholder feedback.
- Examined modelling tools (e.g., HowLeaky, APSIM) and recommended benchmarking to address biases.

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Sondoss, UNSW

- The Program is globally recognised as **progressive and state-of-the-art** in water quality modelling.
- **Significant progress** has been achieved on previous review recommendations, with **no major delays**.
- Areas requiring faster progress include model **QA, transparency and formalised governance**.
- **Collaboration and innovation** are key strengths that should be maintained during structural changes.
- Recommendations focus on:
  - **integrating transport pathways**
  - enhancing **nitrogen modelling**, and
  - addressing **risks from external land use and climate change impacts**.

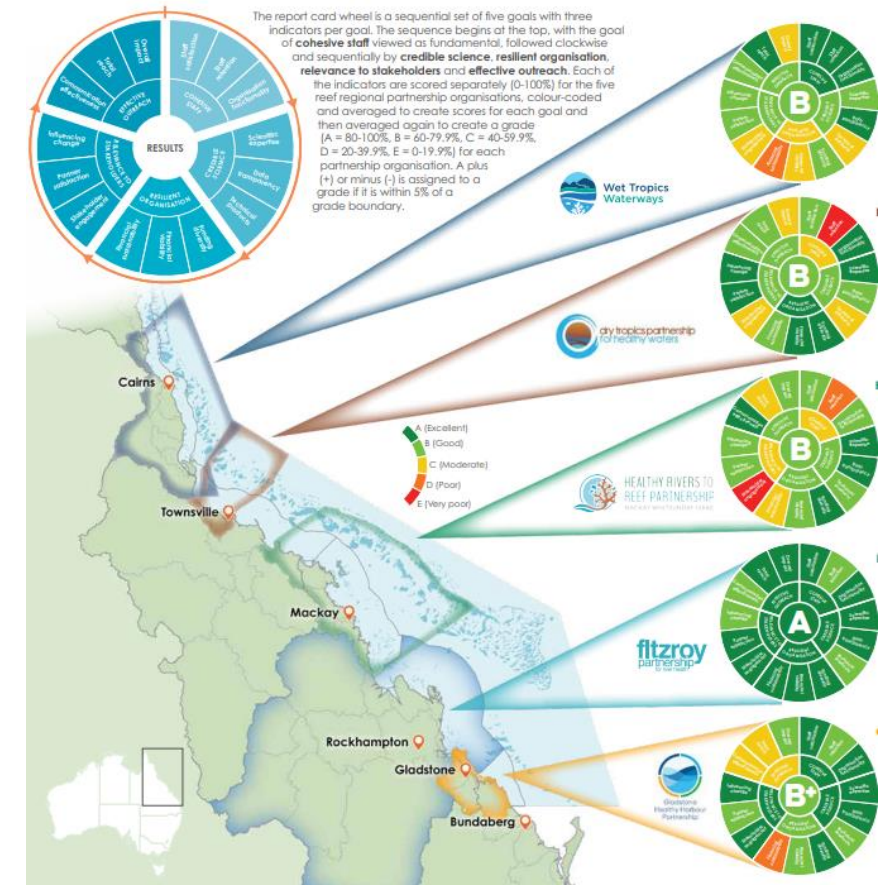
# Regional Report Cards Partnerships

- Partnerships unite stakeholders to promote healthy waterways.
- Produce annual report cards with accessible scientific data and detailed technical reports.
- Operate independently of government.
- Partners include **governments, Traditional Owners, industry, farmers, scientists, tourism, and conservation groups.**
- Regional partnerships reflect local industries:
  - Wet Tropics: CANEGROWERS, Banana Growers Association, and
  - Fitzroy/Mackay Whitsunday Isaac: Mining, Energy, Cotton Australia.

# Regional Report Cards Partnerships – Review

## What's Our Grade?

- Evaluates Reef regional report card partnerships biennially (since 2020).
- An independent contractor leads the evaluation process, through:
  - Hosting an introductory online workshop
  - Evaluating partnerships through online surveys and staff meetings
  - Producing a report card and methodology report, and
  - Presenting findings to Partnership Management Committees.
- The evaluation aims to identify and inform improvements in the partnerships.
- Each partnership is evaluated individually, evaluations are sent to the partnership.





# Human Dimensions Program Review



**Jeanette Gellard**, Evaluation strategist  
*Innovative Influences*

Jeanette has over 30 years' experience working with people in rural and regional Australia



**Valeria Bellan**, Behavioural Scientist/Psychologist  
*AWRI*

Valeria is a psychologist by training and now explores the barriers and drivers that influence practice change in agriculture



**Denise Bewsell**, Principal  
*Scarlatti*

Denise has over 25 years' experience working in monitoring and evaluation, extension and facilitation

Desktop review: documents provided by Behavioural Insights team



Each independently produced a report



Workshop to collate findings, co-develop overall scores & recommendations



Draft final report: feedback from Behavioural Insights team



Final version of reports completed and presented to ISP

# Human Dimensions Program Review

## Key strengths

- ✓ The program is built on a robust theoretical base and informed by comprehensive research.
- ✓ Methodologies are carefully considered and well-designed.
- ✓ The program benefited from a thorough peer-review process with a diverse range of stakeholders.
- ✓ The program demonstrates a strong commitment to ethical practices and transparency, particularly in documentation

## Recommendations

1

Develop a comprehensive project implementation plan.

2

Continue to build and prioritise strengthening the data collection processes.

# Paddock to Reef Program 5-Year Review and Redesign

- A whole of program review is planned for 2025 to:
  - integrate the program component reviews, and
  - develop recommendations for an updated design for the Paddock to Reef program.