

Queensland Government Annual Investment Report 2016-17

Reef Water Quality Protection Plan





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Introduction

This report describes the achievements against the planned outcomes in the Queensland Government Annual Investment Plan 2016-17 Reef Water Quality Protection Plan.

The Reef Water Quality Protection Plan 2013 is a joint Queensland and Australian government plan to deliver improvements to the quality of water flowing to the Great Barrier Reef.

The Queensland Government has dedicated \$35 million ongoing funding to activities that support Reef Water Quality Protection Plan outcomes.

In 2015, the Queensland Government committed an additional \$100 million over five years to meet ambitious water quality targets to achieve up to an 80% reduction in nitrogen, and 50% reduction in sediment from priority catchments by 2025. Out of this funding, \$10 million was dedicated to establishing net free fishing zones in Cairns, Mackay and Rockhampton.

In May 2015, the Great Barrier Reef Water Science Taskforce was established to advise the Queensland Government on the best possible approach to meeting reef water quality targets, and identifying priority areas for investment.

In May 2016, the final Taskforce report was released, with 10 broad recommendations across policy, investment, monitoring and modelling, communications, innovation and governance. In August 2016 the Queensland Government agreed in principle to all 10 recommendations.

The Queensland Reef Water Quality Program encompasses the \$35 million ongoing funding, and the \$100 million over five years under the Taskforce recommendations, to deliver improved reef water quality outcomes.

The Office of the Great Barrier Reef (OGBR) in the Department of Environment and Science is responsible for overseeing the Queensland Reef Water Quality Program, in conjunction with the Departments of Natural Resources, Mines and Energy (DNRME) and Agriculture and Fisheries (DAF).

Key Achievements in 2016-17



Burnett Mary Regional Group

implemented protection measures to improve water quality at six priority wetlands covering more than 300 hectares

Fitzroy Basin Association

completed protection and restoration activities covering more than 246 hectares in significant wetlands



The Small Business Innovation Research project funded two companies to commence feasibility studies to develop cheaper nitrogen sensors



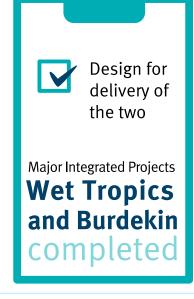




of cane growers

adopted or are adopting an improved management practice







formed, with government, industry, research and community representatives to coordinate efforts

Report Card projects

engaged with BMP



Wet Tropics Healthy Waterways Partnership released its pilot report card



Mackay-Whitsunday Healthy Rivers to Reef Partnership released its first annual report card



Gladstone Healthy Harbour Partnership released its second annual report card



Fitzroy Partnership for River Health released its sixth annual report card



Great Barrier Reef Report Card 2015 was released

First annual

Great Barrier Reef Synthesis Workshop

held with



from reef and water science, management and policy areas

Investment summary

The Queensland Government Annual Investment Plan 2016-17 Reef Water Quality Protection Plan detailed \$58.45 million in projects and activities to support delivery of the Reef Water Quality Protection Plan 2013. This investment was from both the ongoing \$35 million across Queensland Government funding and the new additional \$100 million over five years.

Total program investment for 2016-17 was \$47.9 million. Approximately \$11 million was not expended in 2016-17 due to the time required to establish the new program and execute contracts and partnerships, as well as impacts on a small number of projects due to unfavourable weather conditions. As a multi-year program, future years will spend more, but still achieve the overall program expenditure.

Across the program, the Major Integrated Projects (MIPs), and Great Barrier Reef Innovation Fund projects such as the Enhanced Efficiency Fertiliser Project, Gully Remediation Project and Small Business Innovation Research Projects, all commenced in the second half of the financial year, with only some payments made against the program investment in 2016-17. Delays in monitoring site installations due to weather impacts have reduced the expanded catchment load and enhanced wetland condition monitoring expenditure.

Measuring success

The Program was delivered through three work areas, aligning with the structure of the Reef Water Quality Protection Plan 2013 - prioritising investment and knowledge, responding to the challenge, and evaluating performance. These areas will change in future years with the update of the Plan to be known as the Reef 2050 Water Quality Improvement Plan 2017-22 (Reef 2050 WQIP).

Reporting against the work areas and the 2016-17 Annual Investment Plan is detailed in the following tables.

Funding categories

- R: A discrete reef-specific program
- **S:** Part of a broader state program where funding can be clearly separated to reef regions
- **B:** Part of a broader state program where an approximate allocation is made for reef regions

Abbreviations*

DILGP	Department of Local Government and Planning
DSITI	Department of Science, Information Technology and Innovation
DNRM	Department of Natural Resources and Mines
DAF	Department of Agriculture and Fisheries
ЕНР	Department of Environment and Heritage Protection
NRM Program	Natural Resource Management Program
OGBR	Office of the Great Barrier Reef
QRWQP	Queensland Reef Water Quality Program

^{*} As a result of machinery-of-government changes many of the Queensland Government's department names were changed in late 2017. As the investment was attributed to the former departments their names have not been changed in this document.

Pathway to impact							
	Improves decision making						
6	Improves agricultural practices						
	Improves urban and coastal management						
	Restores ecosystems						
	Measures impact						
	Informs stakeholders						

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved			
Prioritising investment and knowledge											
Coordination and	governance										
Reef science coordination and reporting	\$160,000	Base—DSITI	DSITI	R		Science programs contribute to on-ground improvements.	As Queensland Government's science agency, DSITI's technical expertise, analysis and advice supports science and research programs underpinning the Reef Water Quality Protection Plan 2013. DSITI provides strategic science and information to support the delivery of investment programs. DSITI also participates in governance arrangements, committees and technical working groups, and delivers DSITI's reef science programs under the Queensland Reef Water Quality Program.	Contributed to the development of the Scientific Consensus Statement, review of Reef water quality targets, reviewed the Reef Water Quality Protection Plan 2013, subsequent development of the Reef 2050 Water Quality Improvement Plan 2017-22. Peer reviewed science program technical reports were made available through the Queensland Government open data portal. Collaborated across reef stakeholders to support integrated delivery of policy, science, monitoring, modelling and evaluation, particularly to ensure consistency in field data collection standards and monitoring programs across organisations. Value-added to technical advice from other research organisations to ensure alignment with Government outcomes.			
Reef 2050 Plan and Reef Water Quality Protection Plan implementation and governance	\$980,563	Reef implementation (limited life)— EHP	OGBR, EHP	R		Continued implementation of both plans. Progress towards targets.	OGBR coordinates the implementation of the Reef 2050 Plan and Reef Water Quality Protection Plan 2013 across the Queensland Government. OGBR leads the review of the Reef Water Quality Protection Plan 2013, with the Australian Government.	The Reef 2050 Advisory Committee (RAC) met to advise on the implementation of the Reef 2050 Plan and how to respond to coral bleaching. A coral bleaching workshop was held with the RAC and advice was developed for a Ministerial Forum to be held early in the 2017-18 year. Work progressed on the review of the Reef Water Quality Protection Plan 2013, including completion of a program logic workshop across all stakeholders and government agencies. Work progressed on the development of 35 end-of- catchment targets, and a Scientific Consensus statement. A draft Reef 2050 WQIP (formerly the Reef Water Quality Protection Plan) was released for public comment early in the 2017-18 year.			

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Reef policy— management and planning	\$56,432	Base—EHP	OGBR, EHP	R		Continued improvement in reef health through policy management, planning and administration.	OGBR held stakeholder consultation in development of the Regulatory Impact Statement. DSITI Water Tracking and Electronic Reporting System (WATERS) holds water quality data for 130 point source and 202 Queensland locations. This project has produced a digital database of nutrient point source releases within GBR catchments. This information is essential for improving source catchment modelling and future review of industry standards.	A draft discussion paper, and draft consultation regulatory impact statement (RIS) were developed. The outcomes of this project will inform minimum standards development.
Coordination and governance of regional Natural Resource Management (NRM) program component for reef regions	\$606,756	NRM Program (limited life)— DNRM	DNRM	В		Protect, improve and restore waterways and rangelands to improve water quality.	This investment provides for DNRM to effectively and efficiently administer grants, maintain program database systems, monitor and evaluate project outcomes, coordinate GBR and NRM investment, and engage with regional delivery organisations.	Managed administration and governance of reef components, including NRM program secretariat and oversight, outcome reporting, budget acquittal and reporting, project auditing, and regional engagement.
Queensland Reef Water Quality Program management	\$1,570,213	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Accelerated progress against water quality target through successful delivery of the Queensland Reef Water Quality program.		Established Office of the Great Barrier Reef governance including secretariat support to advisory committees, program oversight for procurement, finance, budget management and reporting, and project management and delivery.
Annual governance health check	\$ 0	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP and Australian Government	R		Improve governance - include agreement on objectives, alignment of programs, and clarity of roles, responsibilities and accountabilities.	This project is to commence in the 2017-18 financial year.	

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Research and dev	velopment/scie	nce/innovation						
Reef water quality research and development	\$4,884,384	Reef Water Quality Science Program (limited life)—EHP	OGBR, EHP	R	5	Improved on-ground outcomes deriving from research and development.	Investment in research and development in 2016-17 continued to be in the areas of nutrient use efficiency, weed management in cane systems, sediment management, optimum soil phosphorous in banana systems, economic analysis of banana BMP practices, demonstration and promotion of on-ground practice change.	 32 projects were underway in 2016-17, across areas including: improved knowledge of nutrient and sediment processes in agricultural systems pesticide monitoring and progress towards guidelines on-ground demonstration of improved practice engagement of cane farmers to achieve increased uptake of improved land management practices water quality monitoring in specific locations.
Sugar Research Australia (SRA) funding	\$712,000	Base—DAF	SRA	В	5	Improved nutrient management standards as a result of research.	DAF invests in the following SRA projects aligned to Reef water quality outcomes: 2014/045 – Boosting N-use efficiency in sugarcane through temporal and spatial management options2014/050 – Developing an alternative herbicide management strategy to replace PSII herbicides in the Wet Tropics areas 2014/015 – measuring profitability and environmental implications when growers transition to BMP.	These multi-year projects are still in progress and annual project milestones are published by SRA in its annual Performance Report. See link https://sugarresearch.com.au/
Annual Great Barrier Reef synthesis workshop - science, management and policy	\$154,414	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Inform the development of the Scientific Consensus Statement, establishing effective dialogue between science and management, and synthesising science to inform policy and future direction.	The Office of the Great Barrier Reef coordinates annual synthesis workshops across science, management and policy to support implementation of the Queensland Reef Water Quality Program and Reef Water Quality Protection Plan.	First annual Great Barrier Reef Synthesis Workshop held in November 2016 with 110 participants from science, management and policy. Workshop outcomes provided to inform development of the 2017 Scientific Consensus Statement on Land Use Impacts on the Great Barrier Reef Water Quality and Ecosystem Condition. Identification of small research projects to undertake during the year.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved			
Prioritisation and Cost-effectiveness											
Costings project	\$49,000	Queensland Reef Water Quality Program (limited life) - EHP	Alluvium	R		Costings information improves investment decisions.	The costing report was undertaken by a consortium of economic and water quality experts to inform the investment that may be required to meet the Reef 2050 Long-Term Sustainability Plan water quality targets (up to 80% nutrient and up to 50% sediment reduction by 2025).	Completion of consultant's report – Costs of achieving the water quality targets for the GBR. The data and report findings have been used to inform decision-making on Reef water quality initiatives, including regulatory approaches for nutrient and sediment reduction in GBR catchments.			
Investment planni	ng										
Explore innovative financing mechanisms	\$19,800	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Inform the uptake of conservation financing mechanisms.	Project undertaken to explore innovative financing mechanism applicable to investment into the Great Barrier Reef.	Project completed.			
Developing opportunities for public-private partnerships	\$0	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Long-term continuity and strategic leveraging of government investment.	Collaborative agreement with Greening Australia focussed on trialling innovative gully remediation.	Reported in On Ground: Grants and System Repair.			

Total investment \$9,193,562

Respond	ing to t	he cl	hal	lenge

Policy and planning	Policy and planning												
Water quality objectives	\$210,000	Base—EHP	ЕНР	В		Water quality objectives completed for all Great Barrier Reef catchments and reviewed every five years.	This work supports Reef 2050 Plan water quality action 9: "Review and update water quality objectives and Great Barrier Reef Marine Park Authority Water Quality Guidelines at Reef-wide and regionally relevant scales based on scientifically verified monitoring and research". EHP schedules environmental values (EVs) and water quality objectives (WQOs) under the Environmental Protection (Water) Policy. EVs and WQOs guide planning and investment activities.	Draft EVs and WQOs materials were prepared and released on the EHP web site for Eastern Cape York, Burdekin, Don-Haughton, Mackay Whitsunday (estuarine/marine), and Fitzroy/Keppel Bay. Consultation materials include reports, tables, and mapping, covering fresh, estuarine and marine waters; and using local water quality information where available. Following stakeholder consultation and submissions, EVs/WQOs will be finalised and submitted for government consideration.					

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Reef water quality offsets	\$o	Base—EHP	ЕНР	S		Increase in proportion of offsets that are contributed to Reef Trust.	This action has been superseded.	As the Queensland Reef Water Quality Program has developed to complement the Reef Trust, this action has been superseded. Offsets from Queensland regulatory processes will be managed by Queensland Government.
Catchment and regional planning	\$350,000	Base—DNRM	DNRM	В		Alignment of catchment and regional plans to Reef 2050 Plan objectives and accredited water quality improvement plans.	DNRM contributed to the statutory planning framework within the Reef catchments by providing advice to avoid, mitigate and minimise poor water quality outcomes. This advice considers impacts of regulated vegetation removal, instream works, flood control measures, and disturbance of soil and acid sulphate.	Two new state planning policy compliant planning schemes aligning to the Reef 2050 Plan objectives and accredited water quality improvement plans, have commenced during the past year. Three schemes are currently in draft form. DNRM has been working with DLGIP to develop the new State Planning Policy and transitioning to the new Planning Act 2016.
Wetlands management	\$200,000 \$206,055	NRM Program (limited life)— DNRM Base—EHP	ЕНР	S		Continued reduction in loss of wetlands. Continued improvement in contribution of modified wetlands to ecosystem outcomes.	EHP provides the policy and governance framework for the management of wetlands through the Queensland Wetlands Program Governance Group and a broader Great Barrier Reef Wetlands Network.	The Wetlands Team has been lead author and contributor for various sections of the 2017 Scientific Consensus Statement. The Team has developed a draft ecology education module to be released on WetlandInfo. Delivered 'Walking the Landscape' and management intervention workshops. Release of 'Wetlands and disaster management' web page. Release of the catchment story for the Murray.
General Great Barrier Reef policy work	\$250,000	Base—DNRM	DNRM	R		Policy work contributes to Reef improvements.	DNRM funded policy work that contributes to the GBR work program of improving water quality.	DNRM contribution to the development of EHP's proposed Reef Regulations. Work on designing new Reef water quality NRM projects. Contribution to Commonwealth policy development on cumulative impacts and net benefits.
Coastal planning	\$200,000	Base—EHP	ЕНР	В		Planning decisions align with Reef 2050 Plan actions and reflect water quality outcomes.	EHP develop in partnership with DILGP, improved coastal hazard mapping and strengthening laws to avoid development in erosion prone areas (including areas vulnerable to sea level rise) and to protect natural coastal processes, landforms and vegetation.	Strengthened coastal policy (State Planning Policy and State Development Assessment Provisions and development assessment trigger layers) for improved protection and management of the coastal zone.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved				
Regulation and co	Regulation and compliance											
Development of regulation approaches	\$6,432	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Reduce catchment pollution loads through improved agricultural, urban and industrial activities.	Coordinate policy and planning outcomes for all Reef-associated activities across Queensland Government. Develop and implement regulatory approaches.	OGBR continue to progress GBR protection regulation package under the <i>Environmental Protection Act 1994</i> to reduce nutrient and sediment pollution across the Reef region.				
Compliance program	\$1,000,000	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Reduce catchment pollution loads through improved agricultural activities.	On farm inspections, focus on informing and assisting industry to meet their regulatory obligations.	A new compliance program under the current Reef regulations for sugarcane and grazing properties has been instigated in the Wet Tropics and Burdekin catchments.				
Urban stormwater program	\$207,500	Queensland Reef Water Quality Program (limited life) - EHP	Reef Urban Stormwater Management Improvement Group	R		Reduce pollution loads flowing to the catchment through improved urban stormwater management.	Improve the capacity of local governments, natural resource managers and industry for erosion and sediment control in the GBR regions.	The QLD Urban Water Strategy –developed in collaboration with more than 50 industry, government, and non-government representatives from across QLD – set priorities, goals and actions for improving urban stormwater management. Reef Urban Stormwater Management Group revitalised. Urban Stewardship Framework reviewed urban development report card methodology for improved reporting outcomes. Erosion and sediment control demonstration site designed and installed, and demonstrations held in Townsville. Eighteen meetings, briefings, training sessions and tours with GBR local governments.				

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Partnerships								
Partnership with the Great Barrier Reef Foundation	\$55,710	Queensland Reef Water Quality Program (limited life) - EHP	OGBR	R		Reduce sediments flowing to the catchment and Reef	In early 2017, \$1 million was approved for investment towards sediment management actions on Springvale Station in the Normanby River catchment. These actions are to be guided by the Springvale Station Erosion Management Plan.	These actions will be delivered and reported in 2017-18.
Funding for emerging partnership opportunities and project	\$ 0	Queensland Reef Water Quality Program (limited life) - EHP	ЕНР	R	N/A		The program of work under this investment is currently being developed.	Projects such as the Central Queensland investment in Reef Water Quality, to be delivered in 2017-18 and 2018-19 financial years, will be delivered by a range of partners.
Best Management	Practices (BM	P)						
Best Management Practice (BMP)	\$4,723,533	Queensland Reef Water Quality Program (limited life) - EHP	Smartcane BMP Grazing BMP Banana BMP Grains BMP	R		Increase in the area of land managed under BMP. Increase in the number of farmers and graziers participating in the BMP. Increase in the number of farmers and graziers accredited for BMP.	The QRWQP supports voluntary, industry-led BMP programs for cane, grazing, growing and bananas to assist producers identify practices that improve long-term productivity, profitability and sustainability of their enterprise, and identify the steps that incorporate Best Management Practices. Other activities include the development of management practice standards, partnership projects to demonstrate improved practices, and support to align state and federal government programs with nutrient use efficiency, grazing land management and erosion response.	Increase in the area of land managed under BMP. At the end of June 2017, the area of land managed in Reef catchments under Smartcane BMP is approximately 66% (266,832 ha); and the area under Grazing BMP is approximately 44% (12,438,066 hectares) Increase in the number of farmers and graziers participating in the BMP. As at the end of June 2017, 1,534 cane producers were benchmarked in the three core modules of Smartcane BMP, with 1,297 graziers engaged in Grazing BMP. 206 cane producers are accredited in the three water quality Smartcane BMP modules, and 87 grazing businesses are accredited in all five modules. Approximately 73%, (some 8,630ha), of Wet Tropics banana production is included in the BMP program. An agreement was signed in April 2017 with the grains industry to provide support for the grains BMP. Note – outcomes for the grains BMP program will be reported in the 2017-18 investment report.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Extension								
Extension and training aligned to Best Management Programs and regional coordination of onground activities	\$1,200,000 \$1,200,000 \$2,024,000 \$95,000	Base – DAF Limited life - DAF Limited life—EHP NRM Program (limited life)— DNRM	DAF DAF	S R R B		Increase adoption of improved land practices by farmers.	Senior scientists, agronomic specialists and economists provide on-ground support to producers, and mentor staff delivering extension to the cane, grazing, grains, and banana and horticulture BMP programs. DAF economists have undertaken economic validation of improved practices, particularly in cane and banana farming. Understanding financial implications of practice change is a critical factor influencing and accelerating adoption. DAF, in collaboration with NRM groups, assisted with coordinating extension programs to improve the efficiency and effectiveness of producer support services. Spatial data collation identified where effort has been aligned in relation to priority catchments. DAF assists producers to better manage wetlands on and adjacent to their properties through the Wetlands in Agriculture: Training, Extension & Resources (WATER) project.	At the end of June 2017: More than 1,400 grazier and 1,100 cane grower engagements with DAF BMP related activities. Independent surveys indicated that 74% of graziers and 55% of cane growers had adopted or were adopting an improved management practice aligned to BMP programs. Case studies by DAF economists demonstrated the financial benefits of improved practices in cane and banana production. Case studies are available online at: https://publications.qld.gov.au/dataset/best-management-practices-for-sugarcane The training needs for extension providers across the Reef catchments have been collated and will form the basis of training to be implemented in 2017/18. Outcomes of the WATER project are published on the WetlandInfo website.
Development of expanded extension and education programs	\$150,000	Queensland Reef Water Quality Program (limited life) - EHP	EHP/DAF/ industry	R		Undertake an assessment of extension and education activities, and develop an implementation strategy for enhanced extension and education activities.	Consultant reviewed extension and education services currently delivered in GBR catchments to make recommendations going forward. Stakeholders engaged to participate in review at group workshops.	Two stakeholder meetings/workshops held in Brisbane in February and May 2017. Funding support for stakeholder meeting at APEN conference in September 2017. Plan for further investment in development extension and education programs underway.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Communications a	and behaviour (change						
Communication activities across the Great Barrier Reef	\$53,745	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Improved coordination and integration of communication activities, and increased adoption of behaviours regarding improved water quality.	The communications project incorporates a range of actions including: • developing a single, easy-access Great Barrier Reef portal on the Queensland Government website • hosting an annual Synthesis Workshop – science, management and policy – where new scientific knowledge will be synthesised to inform major on-ground projects, science investments, and policy and future direction • forming a Reef 2050 Communication Network to ensure consistent messaging and coordinated activities • involving the broader community in protecting the Great Barrier Reef.	A new Great Barrier Reef portal landing page (www.qld.gov.au/ greatbarierreef) was developed on the Queensland Government Environment, Land and Water franchise. The Reef 2050 Communication Network was formed to provide intergovernmental, regional and stakeholder input into Reef 2050 communication activities. Great Barrier Reef Foundation partnership developed a Reef Think Tank educational display, launched at the World Science Festival in March 2017, and toured regional locations. A science communicator was contracted to support the delivery of a variety of plain English products based on scientific information from across the Queensland and Australian governments.
Communication tools to support the Great Barrier Reef Innovation Fund Enhanced Efficiency Fertiliser project	\$100,000	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Stakeholders are informed of the Great Barrier Reef Innovation Fund project, and increased adoption of improved land practices by farmers.	Funding was provided to the Australian Government to support communication relating to the Enhanced Efficiency Fertiliser project.	CANEGROWERS prepared a communication strategy to support the EEF60 project. The strategy targets sugarcane growers, industry, government and the community. Material will be rolled out as the trials progress and when there is confidence in the results.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Behaviour change projects	\$565,046	Queensland Reef Water Quality Program (limited life) - EHP	OGBR, EHP	R		Increase adoption of improved behaviours of targeted community groups.	The Cane Changer Project, a two year innovative behaviour change project, aiming to increase the adoption of sustainable cane farming practices. RP161 Complete Nutrient Management Planning for Cane aims to engage 90 cane farms (over two years) in the Burdekin, to help adjust fertiliser rates in line with SIX EASY STEPS, as required for their crop. This will contribute to Reef 2050 Plan objectives of achieving at least 50% reduction of nitrogen in anthropogenic end-of-catchment dissolved inorganic nitrogen loads in priority areas. The project also supports social monitoring to investigate project success factors and look for improvement areas.	Cane Changer Design and feasibility testing of the Leadership and Ownership Behaviour Change Strategy complete and four behaviour change tools developed. Cane Changer Leadership group was formed. 110 farmers have signed a Cane Changer commitment. Young and old grower mentorship program commenced. Grower-Miller Cooperation Workshop held. A Monitoring, Evaluation, Reporting and Improvement (MERI) plan and baseline has been completed. RP161 Completed one social monitoring study with Griffith University and determined a high level of satisfaction with the project with minor improvement suggested. SRA provided 9 SIX EASY STEPS workshops to RP161 farmers. Farmacist engaged 51 cane farms in 2016-17 and achieved an 82 tonne nitrogen reduction in the first year of engagement.
On Ground: Grant	s and System R	Repair						
River Improvement Trusts	\$400,000	NRM Program (Limited life)— DNRM	DNRM	S		Projects target water quality outcomes.	River Improvement Trusts (RIT) projects with identified outcomes that deliver improved water quality to GBR Lagoon.	Herbert RIT Structural works in Herbert River. Cairns RIT Structural works in Cairns City, Wrights Creek, Mulgrave, Babinda Creek. Cassowary Coast RIT Structural works Tully / Murray Basin and Johnstone River.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Regional Natural Resource Management groups—local projects	\$2,116,325	NRM Program (Limited life)— DNRM	Various Regional Bodies	S		Projects deliver ecosystem restoration and water quality outcomes for the Reef.	DNRM has invested in Regional NRM groups to deliver projects which support Paddock to Reef outcomes as well as projects which align with relevant water quality improvement plans. NRM groups have delivered regional Paddock to Reef activities - collect, collate and provide quality nutrient, pesticide, herbicide, management practice change data and assist in wetland assessments for the Paddock to Reef program, and projects that meet Reef Water Quality Protection Plan objectives.	Fitzroy Basin Association completed protection and restoration activities over 246 hectares in significant wetlands. Nine property holders undertook best management grazing practices. Burnett Mary Regional Group implemented protection measures at six priority wetlands covering more than 300 ha to improve water quality. The soil conservation project targeted actively eroding priority sites in the Western Burnett. North Queensland Dry Tropics improved management practices, and education of landholders led to reduced fertiliser and pesticide loads migrating into the Horseshoe Lagoon wetland and the Reef. Terrain NRM in the Wet Tropics undertook the Walking the Landscape process bringing technical and community experts together creating four investment and remediation plans. Cape York NRM's water quality project increased the quantification of poorly understood risks to water quality, implemented actions according to impacts, and designed
Great Barrier Reef Innovation Fund: Enhanced Efficiency Fertiliser Project	\$2,000,000	Queensland Reef Water Quality Program (limited life) - EHP	Reef Trust	R		Develop, trial and implement innovative approaches to improve Reef water quality.	Significant jointly funded investment between OGBR and the Australian Government through Reef Trust, into the use of enhanced efficiency fertiliser in the sugarcane industry.	monitoring, and management practice change frameworks with land managers, stakeholders and experts. CANEGROWERS and Sugar Research Australia (SRA) contracted to deliver trials of enhanced efficiency fertiliser use in the sugarcane industry. The project will specifically target fertiliser nitrogen losses to the Reef from cane farms by increasing Nitrogen Use Efficiency (NUE).
Great Barrier Reef Innovation Fund: Small Business Innovation Research Project	\$177,250	Queensland Reef Water Quality Program (limited life) - EHP	Advance Queensland	R		Develop and supply affordable fine scale monitoring sensors for deployment in Reef catchments.	Funding provided to proponents to commence feasibility study for the development of cheaper nitrogen sensors for deployment in Reef catchments.	Development and refinement of monitoring sensor prototypes with a view to conducting field trials in 2017-18.
Great Barrier Reef Innovation Fund: Gully Remediation Project	\$750,000	Queensland Reef Water Quality Program (limited life) - EHP	Greening Australia	R		Develop, trial and implement innovative approaches to improve Reef water quality.	A Collaborative Agreement between Greening Australia and Queensland Government was signed in 2016 focusing on trialling innovative gully remediation techniques that may be applied across Reef catchments.	A project team was established to undertake the project. A forum explored innovative remediation techniques. A final report is being drafted. A baseline fine scale mapping and gully classification has been completed for the Strathalbyn site.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Major Integrated Projects: Design, Development and Phase 1 Implementation	\$930,920	Queensland Reef Water Quality Program (limited life) - EHP	Regional delivery agents OGBR, EHP oversight	R		Demonstrate the impact of targeted integrated approaches to onground water quality improvement. A monitoring and evaluation program for the Major Integrated Projects is developed and implemented. Data is collected that can determine the success of projects in reducing water pollution.	The objective of the major integrated projects (MIPs) is to work closely with groups of landholders in one or two focus areas within the Wet Tropics and Burdekin regions, to trial a range of regionally tailored, coordinated actions that reduce nutrient, sediment and pesticide loads entering the Great Barrier Reef waters. Throughout the MIPs, the progress in achieving land management practice changes, economic benefits for landholders and pollutant load reductions will be closely monitored, and results will inform adaptive management. It is expected that by concentrating effort into one or two areas and closely involving landholders in the design and implementation of the projects, a steeper trajectory in water quality improvement will be achieved than would otherwise occur. Support was provided by the Office of the Great Barrier Reef for the design of the monitoring and evaluation program that will assess the effectiveness of the Major Integrated Projects when implementation commences in 2017-18.	NQ Dry Tropics and Terrain NRM – were appointed to lead the design process on behalf of consortium partners in the Burdekin and Wet Tropics regions, respectively. Meetings and workshops were held over several months with an extensive range of stakeholders to: outline and clarify expectations for the projects; recruit Project Panels with landholders and technical experts to guide the development of program designs for each project; seek input from landholders, community groups, Traditional Owners and other local stakeholders to identify key activity areas for each project; seek feedback and advice from an over-arching MIPs Steering Committee regarding draft program designs and monitoring strategies and linkages with other programs. Program designs and monitoring strategies for the three years of implementation and preparation of first year (2017-18) project plans for implementation activities have been prepared. Monitoring, Evaluation and Reporting (MERI) Frameworks were developed and support provided for project panels. Catchment modelling input provided into the development of the projects. Process for benchmarking for land management adoption established. Design of a farm scale monitoring program for Wet Tropics was developed. Paddock scale monitoring in the Johnstone to include groundwater baseline monitoring.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Rural Water Use Efficiency Program	\$1,280,000	NRM Program (Limited life)— DNRM	DNRM	S		Improved use of on- farm water supplies results in reducing water use and associated run-off.	Rural industry bodies continue to deliver services in Great Barrier Reef catchments such as: Precision irrigation: Irrigation management information systems providing real time climate and soil-water data Decision support tools to schedule irrigations and maintain records of irrigation events Irrigation system management: Pressurised irrigation system evaluation to determine distribution uniformity Furrow irrigation assessment to quantify inflow rates and runtimes.	Water use efficiency gains were achieved across GBR catchments, reducing water use and run-off to the GBR. Irrigation assessments and scheduling changes improved on-farm water management. Producers adopted improved water, energy and/or nutrient practices. Multiple demonstrations and case studies developed to showcase better practices. Conjunctive use of surface water with groundwater to address deep drainage in the Lower Burdekin.

Total investment \$20,451,516

Evaluating performance

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Monitoring	Monitoring											
Catchment loads monitoring	\$730,000 \$500,000	Base—DSITI NRM Program (Limited life)— DNRM	DSITI	R		Monitoring data is used to measure catchment load pollutants within agreed timeframes.	Monitor water quality constituents (nutrients, sediments and pesticides) exiting priority Great Barrier Reef catchments, as part of Reef Plan 2013 and provide high quality pollutant loads data from priority catchments for validation of the Source Catchments water quality models. Engage government agencies, agricultural industries and regional natural resource management bodies to disseminate yearly program outcomes.	Monitored water quality and calculated pollutant loads data for nutrients, sediments and pesticides in 36 priority catchments to inform the 2015 Reef Report Card. During 2016-17, the program provided data, reporting, technical advice and information to support a range of projects including the 2017 Scientific Consensus Statement, P2R Program, eReefs, LTSP 2050.				

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Reef Blitz	\$40,000	NRM Program (Limited life)— DNRM	Great Barrier Reef Foundation	R		Monitoring data is used to measure Reef condition.	DNRM provided funding to the Great Barrier Reef Foundation to engage the community in collection and communication of Reef data.	A community program involving five community events in 2016 and a corporate challenge which involved 40 participants engaging in a citizen science program.
							communication of Reel data.	Fifteen educational events were delivered providing students with hands-on experience with Reef ecology and on-ground monitoring.
Ambient water monitoring	\$4,800,000	Base - DNRM	DNRM	S		Water monitoring infrastructure within	Validated flow data has been provided to support load reporting and to	Water monitoring infrastructure within GBR catchments has produced reliable data.
						Great Barrier Reef catchment produces reliable data.	continue to improve calibration of catchment modelling.	Reliable and validated flow and quality data from the ambient network provides a historical dataset to underpin a range of modelling efforts in the reef program, including the eReefs project.
Landscape monitoring	\$950,000	Base - DSITI	DSITI	R		Monitoring contributes to Great Barrier Reef	Provide a range of landscape monitoring and scientific computing	High performance computing systems maintained, including enhancements to accommodate new Sentinel 2 satellite imagery.
						and regional report cards.	Reef programs. Gully monitoring procedures using laser technology devantage and implemented.	Gully monitoring procedures using laser technology developed and implemented.
		R&D, guily monitoring, crop monitoring, fire scar mapping, mapping soil erodibility, sources of bioavailable particulate nutrients, decision support and prepared 2016 mapping for release	Long-term crop monitoring enhanced to include Landsat and Sentinel data and estimate broad crop types.					
							particulate nutrients, decision support	Released 2015 annual fire scar composite mapping to open data and prepared 2016 mapping for release.
							and improved management practices for informed nitrogen management and nutrient use efficiency.	Developed spatial metrics to better represent ground cover patchiness, and preliminary development of user products.
								Provided data and technical advice to the Springvale Erosion Management Plan, including site visits.
								Delivered the final reports for RP20 - N Requirements of Burdekin Soils and RP110C.
								Delivered and published final reports for RP128G.
								Delivered erodible soils mapping for Fitzroy NRM Region.
High resolution satellite imagery	\$1,260,000	Limited life - DNRM	DNRM	R		Monitoring contributes to Great Barrier Reef and regional report cards.	DNRM has invested in acquiring annual 80cm and quarterly 3m high resolution satellite imagery to assist in GBR monitoring.	Imagery can be accessed through spatial web services or direct download and has been utilised for GBR catchment monitoring and natural disaster mapping purposes.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
State Land and Tree Survey (SLATS)	\$210,000	Base - DSITI	DSITI	S		Monitoring contributes to Great Barrier Reef and regional report cards.	Monitor woody vegetation extent and clearing of vegetation in all Reef catchments. Provide statistics and spatial data to support policy and compliance under the Vegetation Management Framework, including provisions for protection of vegetation in key Reef catchments. Provide foundational data for catchment models, and prioritising and reporting on on-ground investments.	Released the 2014–15 SLATS report and accompanying regional and Reef catchments data summary report. Digital data sets published as Open Data. Completed change monitoring of 2015-16 woody vegetation clearing and prepared data and report for release.
Satellite image archive, calibration and systems	\$340,000	Base - DSITI	DSITI	S		Monitoring contributes to Great Barrier Reef and regional report cards.	Provide foundational infrastructure and satellite imagery archive to support production and development of a range of monitoring and reporting spatial data sets. Maintain a repository of computer processing code to support the production of foundation monitoring spatial data products. Provide infrastructure and support to field based programs. Provide a range of spatial data products to support paddock and catchment water quality modelling. Develop a standard LiDAR processing system to produce DEMs vegetation height and cover products for end users.	Satellite image archive maintained for Reef catchment areas including ongoing download, processing and storage of Landsat and Sentinel imagery archive. Delivery of more accurate imagery as input data to support water modelling and monitoring programs. Continued development of Sentinel-2 capability, adapting Landsat-based procedures and developing new products (e.g. woody vegetation change and ground cover data). Extensive user support and delivery/provision of spatial data products to a wide range of government and non-government Reef stakeholders. LiDAR processing system developed and standard products processed
Groundcover and riparian mapping	\$100,000	NRM Program (limited life) – DNRM	DSITI	S		Monitoring contributes to Great Barrier Reef and regional report cards.	Monitor the levels and changes of in-ground cover in grazing lands as a measure of the risk to soil erosion and grazing land sustainability.	Preparation and publication of spatial datasets, results and technical reports regarding on-ground cover in grazing lands for the 2015 and 2016 Reef Report Cards.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Monitoring wetland extent and condition - values assessment	\$300,000 \$150,000	Base – DSITI NRM Program (limited Life) – DNRM	DSITI	S		Monitoring contributes to Great Barrier Reef and regional report cards.	Monitoring and research to establish the foundation for a comprehensive freshwater assessment and monitoring program to track progress towards the Reef 2050 Plan wetland target of no net loss of Reef wetlands, and to inform the Paddock2Reef Program. Provide assessments and advice, including expert witness statements, and updated state-wide mapping on wetlands.	Implemented the Wetland Condition Monitoring and Reporting Program. Reported on the baseline condition of wetlands within significant floodplain areas. Wetland condition assessments for baseline reporting in the 2016 Reef Report Card. Completion of 22 wetland map reassessments of 67 wetlands. Continued migration of wetland mapping code base to ArcGIS python code in preparation for Queensland Wetlands Version 5.0 map production. Data collected for pesticide case studies in Wetlands. Produced Wetlands maps and data to support State legislation, planning and assessments, community and stakeholders.
Management practice adoption	\$472,000	Limited Life – DAF	DAF	R		Monitoring contributes to Great Barrier Reef and regional report cards.	Assessments of farm management data form the basis of pollutant load reduction modelling which in turn informs the investments of the Queensland and Australian governments in the Reef Water Quality Protection Plan and the Reef 2050 Plan.	Consistent M&E frameworks and cloud geodatabase methods for all water quality-related investments were implemented. Digital and spatial data collection tools (e.g. ESRI Collector app) were rolled out with delivery organisations to improve data collection. Farm management practices were benchmarked and monitored in the grazing, sugarcane, horticulture, grains and banana industries, across 47 major river basins across the GBR. Data collection and analysis for the Great Barrier Reef Report Card 2016 was completed.
Management practice adoption support	\$0 in 2016-17 contract signed May 2017	Queensland Reef Water Quality Program (limited life) - EHP	DAF	R		Development of new tools to better utilise practice information in investment decisions.	This is part of a four year investment to improve the confidence in the Paddock to Reef Management Practice Adoption program. It will develop independent evaluations of the impact of on-ground interventions. The project will also benchmark practices, gather alternative lines of evidence of practice change, and develop an online tool to calculate water quality benefits of on-ground activities.	The project commenced in July 2017. Work has commenced on developing a web based tool (Water Quality Calculator) for estimating impacts of farm management change on pollutant loss from sugarcane, grain, and banana farms.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Expanded catchment pollution load monitoring	\$1,586,000	Queensland Reef Water Quality Program (limited life) - EHP	DSITI	R		The number of sites in the Great Barrier Reef that are monitored for catchment load data are increased.	Expanded catchment monitoring in response to the recommendations of the Great Barrier Reef Water Science Taskforce.	Installed, commissioned and commenced monitoring at seven additional sites. Three additional sites were manually monitored due to logistical constraints. Real-time probe deployment at 11 sites.
Enhanced wetland condition monitoring	\$182,000	Queensland Reef Water Quality Program (limited life) - EHP	DSITI	R		Capacity for monitoring wetland condition is improved.	The enhanced wetland condition monitoring program provides for additional monitoring sites in the Normanby and Wet Tropics. This investment provides wetland condition reporting on GBR catchment scale of wetland status and trends in wetland condition.	Monitoring and assessment of wetlands extended across all Natural Resource Management regions. Full implementation of the wetland condition monitoring program. Submitted report on design and analysis methods for independent review.
Modelling								
Catchment loads modelling	\$647,923 \$530,000	NRM Program (limited life)— DNRM Base—DSITI	DNRM DSITI	R		Modelling data validated and provided within agreed timeframes.	Catchment and paddock scale modelling to estimate the effectiveness of current and alternative management practices that reduce pollutant loads. Support for the eReefs project and tools to support sustainable grazing land practices are provided through this investment.	Catchment modelling load reductions for the 2015-16 reporting year provided to OGBR within the agreed timelines. Tier 1 and Tier 2 report cards and technical reports completed. To support more accurate modelling of nutrient loads to the Great Barrier Reef, a new model for Nitrogen fate and transport in sugarcane was developed.
Modelling support for policy scenario analysis	\$350,000	Queensland Reef Water Quality Program (limited life) - EHP	DNRM	R		Modelling for policy scenario analysis contributes to policy and investment decisions.	DNRM provide EHP with an agreed set of future scenario runs on an annual basis	Specific catchment modelling scenarios are run to supplied specifications to evaluate the effect of management change or development on water quality.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Land use mapping for priority catchments	\$120,000	Queensland Reef Water Quality Program (limited life) - EHP	DSITI	R		Land use mapping for priority catchment is developed and able to inform modelling.	This investment is part of DSITI'S Queensland Land Use Mapping Program (QLUMP), which updates mapping and detects land use change at catchment scale. The latest suitable imagery available will be refined and revised to produce land use change maps for priority NRM regions. This dataset will underpin natural resource management of Great Barrier Reef Catchments and is the basis of the catchment modelling and monitoring framework used to evaluate land management.	Mapping commenced for Burdekin and Burnett-Mary regions. Provided data and information support to Tropical Cyclone Debbie response and recovery.
eReefs	\$969,652	Queensland Reef Water Quality Program (limited life) - EHP	Great Barrier Reef Foundation	R		Increase in capacity of eReefs.	The latest technologies are being used to collate data with new and integrated marine modelling to produce visualisation, communication and reporting tools that span the entire Reef from catchment to ocean.	New marine water quality metric for Reef Report Card is being finalised. A major upgrade to the website is in progress. Several river load reduction scenarios have been modelled using the eReefs BGC model. New methods to visualise and compare scenarios have also been developed as part of this project. Improved connectivity between catchment scale models and eReefs receiving water model.
Data managemen	t							
Spatial and Scientific information Management for Reef data management for reef - maintenance	\$130,270	NRM Program (Limited life)— DNRM	DNRM	R		SSIMR data management meets the needs for Reef management.	DNRM has invested in ensuring a suitable data management system for the Reef is maintained.	SSIMR data management systems and related processes have been maintained and supported and provided a suitable platform for GBR-related information. Reef scientists and project officers have been supported in their use of the data management tools.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Verification and management of land practice change data	\$800,000	Queensland Reef Water Quality Program (limited life) - EHP	DNRM	R		Increased capacity to validate and manage land practice data.	The objectives of this project are to: Provide evidence of, and on-ground demonstration of, the effectiveness of practices for managing sediment, nutrients and pesticides. Provide data for testing and parameterising models, particularly of management effects on water quality. Provide new understanding around the gaps in knowledge regarding water quality processes. Provide data, modelling outputs and technical expertise to support building tools for better informing regional bodies, industry and Government on regional investment priorities. Model a suite of farming system scenarios that represent the management practice combinations. Identify and deliver fine scale gully erosion extent mapping in priority Reef catchments.	Nutrient loss in run-off from sugarcane in the Johnstone catchment, Wet Tropics. Groundwater investigation of nutrient and pesticide loss to groundwater and surface water groundwater connectivity in the Wet Tropics – Silkwood and Mulgrave. Comparison of management practices in sugarcane and Multifarm monitoring of a sugarcane-dominated catchment; Mackay. A paired catchment comparison of the change from pre-European land use to grazing, and the effects of multiple grazing management practices on land condition, nutrient and sediment generation rates from small adjacent catchments in the Fitzroy Basin. Run-off and water quality monitoring from dryland grains cropping and grazing at paddock and increasing catchment scales of a subcatchment of the Fitzroy Basin. Increase paddock modelling capacity, support the current paddock modelling and further development of the models. Mapping gully erosion extent in priority Reef catchment to improve accuracy in catchment models.
Report Cards								
Great Barrier Reef Report Card coordination and implementation	\$160,000	Reef implementation (Limited life)— EHP	OGBR, EHP	R		The Great Barrier Reef Report Card is delivered on time and is successful in communicating water quality target progress and marine condition to stakeholders.	The Office of the Great Barrier Reef manages the production of the Reef Report Card and the Paddock to Reef program within the Australian Government that provides the underpinning data and scientific information.	The Great Barrier Reef Report Card 2015 has been prepared for joint Ministerial release. It outlines progress against land and catchment management targets and water quality targets, and assesses the health of the inshore marine environment.

Program	Expenditure	Funding source	Delivery agent	Funding category	Pathway to impact	Measuring outcomes	Investment summary	Outcomes achieved
Regional report card partnerships: Gladstone Healthy Harbour Partnership Mackay-Whitsunday Healthy Rivers to Reef Partnership Wet Tropics Healthy Waterways Partnership Fitzroy Partnership for River Health	\$1,442,857 \$610,000 \$120,000	Regional Report Cards (Limited life)—EHP Base - DSITI Base -DNRM	OGBR, EHP and various regional partnerships Fitzroy Basin Association	R		Annual report card for each existing partnership is delivered on time and is successful in communicating water quality target progress and marine condition to stakeholders. Increasing efficiency and comparability between report cards.	Funding supports the continuation of the Gladstone Healthy Harbour Partnership, Mackay-Whitsunday Healthy Rivers to Reef Partnership, Wet Tropics Healthy Waterways Partnership and Fitzroy Partnership for River Health. Seed funding supported the development of the Townsville regional partnership. Queensland Government monitor, analyse and interpret waterway data for regional report card programs, and provide advice and support through EHP and the Technical Working Groups of regional partnerships. This investment is also delivered through the Central Queensland Ambient Monitoring Program which assesses current and long term trends in water quality and provides estuarine data for regional report cards.	The Wet Tropics Healthy Waterways Partnership released its pilot report card The Mackay-Whitsunday Healthy Rivers to Reef Partnership released its first annual report card. The Gladstone Healthy Harbour Partnership released its second annual report card. The Fitzroy Partnership for River Health released its sixth annual report card.

Total investment: \$17,500,702

Program grand total: \$47,145,780

