Tropical Water Quality Hub

National Environmental Science Programme

Reef & Rainforest RESEARCH CENTRE

Final Interim Report

1 January 2020 - 31 August 2020



Photo: Matt Curnock

The Tropical Water Quality hub is funded by the Australian Government's National Environmental Science Program

National Environmental Science Program
TROPICAL WATER QUALITY HUB
2020 INTERIM REPORT

Hub Name (full activity title): Tropical Water Quality Hub

Host organisation: Reef and Rainforest Research Centre

Key Contact: Sheriden Morris

Contact telephone number: (07) 4050 7400

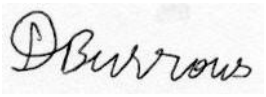
Contact email address: Sheriden.morris@rrrc.org.au

Other consortium partners/subcontractors/research organisations: James Cook University; CQUniversity; Australian Institute of Marine Science; University of Queensland; CSIRO; Griffith University.

Hub Leader Certification

As Hub Leader, I certify that I have taken adequate steps to reasonably assure myself that:

- each required report component is attached;
- the contents of each component of the report is complete and accurate in all material respects;
- funds have been used for the purpose for which they were provided and all funding conditions have been met, Recipient and Other Contributions have been received, and appropriate oversight has been maintained of Hub projects, their progress, performance and budgets during the reporting period;
- all relevant risks to project delivery have been notified to the Department in this and previous reports and that appropriate steps are being taken to manage those risks;
- the Hub and its sub-contractors have current workers compensation and public liability insurances, as required under the Funding Agreement; and
- any remaining funds have been allocated towards Hub activities or identified for refund to the Department.

Signed: 

Hub Leader Name: Professor Damien Burrows

Date: 6 October 2020

Hub Steering Committee Chair Certification:

As steering committee chair, I certify that any issues of concern or matters raised during Steering Committee meetings where the Interim Report was discussed have been adequately resolved, amended or incorporated into the Interim Report submitted to the Department.

Signed: 

Hub Steering Committee Chair Name: Leith Boully

Date: 6 October 2020

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Letter from the Hub Leader

Progress against the Research Plan

Australia's response to the COVID-19 pandemic has created a number of significant flow on effects. The NESP Tropical Water Quality Hub projects have been both adapting to these new measures and ensuring work-to-date continues where safe across all institutions as a way to continue crucial progress in increasing resilience and recovery for the Great Barrier Reef. One of the obvious changes has been no in-person workshops or public engagements, and reductions in fieldwork. Fortunately, the majority of wet season fieldwork was already completed at the time of the initial restrictions. Researchers residing within Queensland, especially north Queensland, have been able to continue with subsequent fieldwork depending on location. In some cases, local collaborators have been engaged to assist with sample collection for example. Where not possible in person, stakeholder engagement has been conducted digitally. In total, 5 projects have had milestones within the reporting period affected at varying levels by COVID-19 impacts (see Attachment A). Despite the disruptions to date, we are still aiming to complete and deliver on all RPv3-RPV5 NESP-TWQ Hub projects by the end of this year, as planned. It is anticipated that only RPv6 NESP TWQ Hub Synthesis projects may require additional extensions to early 2021 to accommodate stakeholder engagement and external independent peer-review.

Tracking with finances

Almost all funding has been allocated to research and other activities. On approval of Research Plan v6, the NESP TWQ Hub had $57,886 allocated to Budget Flexibility Allocation. The Hub's decision in 2018/2019 to ensure all project technical and final reports are independently peer-reviewed is an additional expense to project budgets. In addition, the Hub Steering Committee has agreed to support up to six Traditional Owners to attend the Reef Leadership and Restoration Workshop in November 2020. Any savings from reduced travel that may have resulted as a consequence if COVID is being internally allocated within project budgets to data analysis, reporting, publications and communication of results to end users and stakeholders. The TWQ Hub is not expecting to provide a refund to the Department on conclusion of the Hub.

Managing Final Outputs

Work is progressing on the final synthesis of NESP Hub Research to summarise the learnings, achievements and outcomes from five years of hub operations. This process will seek to support and inform strategic policy and management directions for Australian Government agencies, the Queensland Government Office of the Great Barrier Reef, industry stakeholders and the Reef 2050 Plan, Reef Restoration and Adaptation Program (RRAP) and the Reef Integrated Monitoring and Reporting Plan (RIMReP). The synthesis process was planned around extensive engagement and many meetings. To date, not all of these have been able to be held. Fortunately, five of the six initial planning workshops for the synthesis process were completed before travel restrictions prevented further meetings. This has enabled work on the synthesis to proceed and hopefully, travel and meeting restrictions will ease in time for these products to be workshopped and socialised in person with our partners and stakeholders before they are finalised. Synthesis products for each respective research area under the TWQ Hub will take the form of technical synthesis reports, as well as complementary products such as fact sheets and interactive webinars.

Also in development is an interactive website to summarise the impact of the TWQ Hub investments, allowing users to view water catchments and examine how the research has responded to key end user priorities for improved water quality across coastal catchments and the Great Barrier Reef.

Additional Outcomes this Reporting Period

Crown-of-thorns starfish (COTS) decision support framework and new science on COTS movement (Projects 3.1.1; 4.1; 5.1) has continued to inform the on-ground control activities and further refined the decision support framework for COTS control on the GBR. The decision-making framework is now more efficient due to improved baseline data being incorporated into the program. The

program's ongoing success since implementation has also led to informing the design of a similar Integrated Pest Management Program for the long-spined sea urchin in Tasmania. An initial strategy development contract is now in negotiation with the Tasmanian Department of Primary Industry, Parks, Wildlife and Environment.

Best practice coral restoration for the Great Barrier Reef (Project 4.3)'s review of restoration methods for coral reefs is currently being used to inform the Great Barrier Reef Marine Park Authority's (GBRMPA) permitting and policy updates within these areas. Additionally, ongoing engagements with tourism industry bodies has catalysed a number of additional impacts including a Cyclone Debbie reef restoration recovery program at Manta Ray Bay in the Whitsundays; reef restoration trials at Magnetic Island; and consultation on a number of public underwater art projects.

Tracing the origin and fate of the environmentally detrimental sediment and associated bioavailable nutrients (Project 5.8) produced water quality data that is now informing the Reef 2050 Water Quality Improvement Plan (WQIP) as part of the Catchment Loads Monitoring Program to calculate the most reliable loads from the Burdekin, Tully and Johnstone Rivers in North Queensland.

'Project 25' - farmers, water quality and on-farm decision-making (Project 4.8) has received significant praise from industry and growers alike, highlighting its success as a trust-building framework project. Sampling and analysis of runoff within the Russell-Mulgrave catchment formed the crux of education facilitated for growers in the region. Ongoing dialogue between growers and scientists has led to a greater understanding and acceptance of the results, removed the blame game that existed for water quality issues within the catchment, and is ultimately leading to positive attitudinal change and further uptake and accreditation of best management practices.

Science evaluation of coastal wetland systems repair projects across GBR catchments (Project 3.3.2) continues to provide data and knowledge to the Queensland Government's Wetlands Program to generate conceptual diagrams (e.g. nutrient processing in wetlands), subsequently disseminated via their networks where it is then used by NRM groups for their planning, reporting and product material (factsheets, media) for landholders. This has led to one of the project's case study reports being used by a project partner to facilitate on-ground wetland remediation works and practice change.

Gully remediation effectiveness (Project 5.9) produced a template for gully rehabilitation evaluation used to inform and design the Landholders Driving Change project within in the Burdekin region. The preliminary report from this project has also been used by the Great Barrier Reef Foundation and the Queensland Government to begin informing the next major tranche of water quality investments.

Guidance system for resilience-based management of the Great Barrier Reef (Project 4.5) has developed an ecosystem model surrounding climate trajectories and management intervention benefits for the Great Barrier Reef that informs the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP).

Additionally, the NESP TWQ Hub's data repository, eAtlas has received 23 datasets/scripts from projects for publication on the eAtlas platform since January 2020. The website receives on average, 6,000 users per month. GBRMPA have also started a process of improving their internal data management based on adopting the same metadata standard as used by the eAtlas. GBRMPA are using this standard to align with the broader community and discussions with the eAtlas team helped strengthen the case for adopting the ISO19115/19139 standard.

Research

Attachment A lists the projects funded under the Tropical Water Quality Hub and provides detailed information on the project status, information on outputs and links to products for all projects (where available) as at 30 August 2020. Exceptions to the NESP Data Management and Accessibility Guidelines are also noted here.

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Approved Funding Research Plan Versions 1-6 (This should match the NESP funding, other cash-contribution, and other in-kind contribution listed in RPV6 Attachment C.)					First Approved (Use dropdown)	Start Date	Completion Date	Status (Use dropdown)	Tracking[#] (Use dropdown)	COVID-19 Impact (Use dropdown)	Comment on project progress (Provide a brief explanation of any delays that have occurred, including the reasons for those delays and the action the Hub proposes to take to address these. Include in your response, the expected effects (if any) the delay will have on the project (including on subsequent milestones and overall completion of the project).	Changes from RPV6** (Use dropdown)	Changes from RPV6 (Provide a brief explanation of any significant** changes, or anticipated significant changes, to the project plan since it was last approved. You may also want to note any minor changes to projects such as changes to project team, changes <10% to budget, etc.)	NESP Research Priorities (Enter numbers/ID)	Sustainable Development Goals (SDG's) (Enter number)	Cross-Hub Collaboration (Yes/No)	List Hubs included in Collaboration (If applicable)
		NESP Funding* $	Other Cash Contributions* $	Other In-Kind Contributions* $	Total Other Contributions* $	Total Budget* $													
1.1	Establishing the future NESP CoTS research framework including an ecologically-based approach to the management of CoTS at multiple scales	100,000	0	123,374	123,374	**223,374**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		1.1	15.8	No	N/A
1.2	Developing an approach to evaluate the effectiveness of investments in riparian management in the GBR catchments	99,972	0	68,022	68,022	**167,994**	RPV1	01/07/2015	30/03/2016	Completed	N/A	N/A		N/A		1.2.1	15.3	No	N/A
1.3	A validation of coral geochemical records to reconstruct suspended sediment loads to the Great Barrier Reef lagoon	22,500	0	14,686	14,686	**37,186**	RPV1	01/07/2015	31/01/2016	Completed	N/A	N/A		N/A		1.2.1	14.1	No	N/A
1.5	Legacy of the Lower Burdekin Water Quality Tender	39,795	0	2,984	2,984	**42,779**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		3.5.1	6.6	No	N/A
1.6	Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management	99,944	0	87,569	87,569	**187,513**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		1.4	11.4 14.2	No	N/A

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1.7	Reducing sediment sources to the Reef: testing the effectiveness of managing alluvial gully erosion	100,000	20,000	140,000	160,000	**260,000**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		1.2	15.3	No	N/A
1.8	Sub-catchment scale monitoring, modelling and extension design to support reef water quality improvement	100,000	0	130,000	130,000	**230,000**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		1.2.2	12.4 14.1	No	N/A
1.9	The establishment of a future NESP dredging research investment framework	25,000	0	11,197	11,197	**36,197**	RPV1	01/07/2015	31/12/2015	Completed	N/A			N/A		1.4	14.2	No	N/A
1.10	Identification, impacts, and prioritization of emerging contaminants present in the Great Barrier Reef and Torres Strait marine environments	100,000	9,625	93,397	103,022	**203,022**	RPV1	01/07/2015	15/03/2016	Completed	N/A	N/A		N/A		2.3.1	12.4 14.1	No	N/A

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2.1	Assessing the cumulative impacts of climatic disturbances on inshore GBR coral reefs, identifying key refuges and testing the viability of manipulative reef restoration	85,000	0	162,312	162,312	**247,312**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		2.1	13.1 14.2	No	N/A
2.2	A tradable permit scheme for cost effective reduction of nitrogen runoff in the sugarcane catchments of the Great Barrier Reef	99,721	0	181,361	181,361	**281,082**	RPV1	01/08/2015	29/02/2016	Completed	N/A	N/A		N/A		2.5	14.1	No	N/A
3.1	Seagrass mapping synthesis – A resource for marine park and coastal management	36,000	0	66,257	66,257	**102,257**	RPV1	01/07/2015	15/02/2016	Completed	N/A	N/A		N/A		3.2	14.2	No	N/A
3.2	Improving historical estimates of abundance and distribution of dugongs and large green turtles in western and central Torres Strait	97,674	0	283,547	283,547	**381,221**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		3.2.1	14.2	No	N/A
3.3	Light thresholds for seagrasses of the GBR: a synthesis and guiding document for managing seagrass	29,755	0	51,746	51,746	**81,501**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		2.3.2	14.2	No	N/A
3.4	Developing and refining biological indicators for seagrass condition assessments in an integrated monitoring program	68,583	0	195,244	195,244	**263,827**	RPV1	01/07/2015	31/01/2016	Completed	N/A	N/A		N/A		3.3.1	14.2	No	N/A

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3.5	Assessment of key dugong and turtle seagrass resources in the northern Torres Strait	99,696	0	57,654	57,654	**157,350**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		3.2.1	14.2	No	N/A
3.6	Establishing a research framework for future NESP investment into better understanding of the presence of Box-Jellyfishes (Irukandji) and risks in the Great Barrier Reef	30,000	0	58,747	58,747	**88,747**	RPV1	01/07/2015	28/02/2016	Completed	N/A	N/A		N/A		3.3.3	14.2	No	N/A
3.7	Monitoring the effects of zoning on coral reefs and their associated fish communities in the GBR Marine Park	100,000	0	195,702	195,702	**295,702**	RPV1	01/07/2015	30/12/2015	Completed	N/A	N/A		N/A		3.3.1	14.2	No	N/A
3.8	Towards an integrated monitoring program: identifying indicators and existing monitoring programs to cost-effectively evaluate the Long Term Sustainability Plan	100,000	0	84,236	84,236	**184,236**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		3.3.1	11.4	No	N/A
3.9	Indigenous capacity building and increased participation in management of Queensland sea country	100,000	0	90,471	90,471	**190,471**	RPV1	01/07/2015	30/03/2016	Completed	N/A	N/A		N/A		3.6.2	11.4 14.2	No	N/A
3.10	Benchmarking costs of NRM improvements for the GBR	29,487	7,372	57,821	65,193	**94,680**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		3.4.2	14.2	No	N/A

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3.11	Monitoring and adaptively reducing system-wide governance risks facing the GBR	55,537	0	101,326	101,326	**156,863**	RPV1	01/07/2015	15/03/2016	Completed	N/A	N/A		N/A		3.4.2	11.4	No	N/A
3.12	Development of an offset financial contribution calculator for Reef Trust	80,595	20,149	16,818	36,967	**117,562**	RPV1	01/07/2015	31/03/2016	Completed	N/A	N/A		N/A		3.5.2	11.4	No	N/A
3.13	eAtlas 2015 - NESP data management, Torres Strait NRM plan delivery platform and Torres Strait reef mapping	98,041	0	67,217	67,217	**165,258**	RPV1	01/07/2015	31/12/2015	Completed	N/A	N/A		N/A		3.5.2	14.2	No	N/A
2.1.1	Integrated Pest Management of Crown-of-Thorns Starfish	604,722	25,000	868,956	893,956	**1,498,678**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.1	15.8	No	N/A
2.1.2	Scoping options for low-lying, marginal cane land to reduce DIN in priority wet tropics catchments	94,000	0	130,250	130,250	**224,250**	RPV2	01/01/2016	28/02/2017	Completed	N/A	N/A		N/A		1.2	14.1	No	N/A

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2.1.3	Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: an action research project	480,000	0	983,193	983,193	**1,463,193**	RPV2	01/01/2016	31/03/2019	Completed	N/A	N/A		N/A		1.2	14.1	No	N/A
2.1.4	Demonstration and evaluation of gully remediation on downstream water quality and agricultural production in GBR rangelands	600,000	65,000	732,018	797,018	**1,397,018**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.2	14.1 15.3	No	N/A
2.1.5	What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment	600,000	82,500	746,759	829,259	**1,429,259**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.4	14.1	No	N/A
2.1.6	From exposure to risk: novel experimental approaches to analyze cumulative impacts and determine thresholds in the GBRWHA	410,165	0	427,997	427,997	**838,162**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.4	11.4	No	N/A
2.1.7	Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making	600,000	0	490,500	490,500	**1,090,500**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.2	14.1	No	N/A

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2.1.8	Improved water quality outcomes from on-farm nitrogen management	700,000	378,000	656,503	1,034,503	**1,734,503**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		1.2	14.1	No	N/A
2.1.9	Risk assessing dredging activities	515,806	0	1,419,651	1,419,651	**1,935,457**	RPV2	01/06/2018	01/06/2019	Completed	N/A	N/A		Minor		1.4	14.2	No	N/A
2.1.10	The application and adaptation of mine site rehabilitation approaches to alluvial gully rehabilitation in the Bowen Catchment	100,000	0	130,000	130,000	**230,000**	RPV2	01/04/2016	30/04/2017	Completed	N/A	N/A		N/A		1.2	15.3	No	N/A
2.2.1	Identifying the water quality and ecosystem health threats to the high diversity Torres Strait and Far Northern GBR from runoff from the Fly River	360,000	0	412,110	412,110	**772,110**	RPV2	01/01/2016	30/10/2018	Completed	N/A	N/A		N/A		2.3	14.1	No	N/A

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2.2.2	Impacts of mine-derived pollution on Torres Strait environments and communities	290,000	0	290,000	290,000	**580,000**	RPV2	01/02/2016	30/10/2018	Completed	N/A	N/A		N/A		2.3	14.1	No	N/A
2.2.3	Early warning systems to minimize the risk of box jellyfish stings by empowering stakeholders	250,000	0	957,407	957,407	**1,207,407**	RPV2	01/01/2016	10/12/2018	Completed	N/A	N/A		N/A		2.1	14.2	No	N/A
2.3.1	Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	499,471	0	544,860	544,860	**1,044,331**	RPV2	01/01/2016	30/03/2019	Completed	N/A	N/A		N/A		2.3	14.2	No	N/A
2.3.2	'Human sensors' for monitoring Great Barrier Reef environmental changes and quality of marine waters through harnessing Big Data analysis	227,145	20,000	222,002	242,002	**469,147**	RPV2	01/01/2016	10/12/2017	Completed	N/A	N/A		N/A		2.2	14.2	No	N/A

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2.3.3	Building Indigenous livelihood and co-management opportunities in the Northern GBR –ecosystem services and conservation governance for water quality	250,000	0	297,192	297,192	**547,192**	RPV2	01/01/2016	10/12/2017	Completed	N/A	N/A		N/A		3.6	11.4	No	N/A
2.3.4	Working with traditional owners and local citizens to better manage GBR estuarine wetlands	450,000	0	476,260	476,260	**926,260**	RPV2	01/01/2016	28/02/2019	Completed	N/A	N/A		N/A		3.6	11.4 15.1	No	N/A
2.3.5	eAtlas - Data management for environmental research	450,000	0	474,175	474,175	**924,175**	RPV2	01/01/2016	31/12/2018	Completed	N/A	N/A		N/A		N/A	14.2	No	N/A
3.1.1	Implementation of the crown of thorns starfish research strategy: regional strategies	682,542	175,564	856,063	1,031,627	**1,714,169**	RPV3	01/01/2017	10/06/2020	Ongoing	Delayed	N/A	The two final reports are delayed due to external peer review. An extension has been approved to 30 October 2020.	N/A		1.1	15.8	No	N/A

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3.1.2	Improving water quality for the Great Barrier Reef and wetlands by better managing irrigation in the sugarcane farming system	458,103	0	426,878	426,878	**884,981**	RPV3	01/01/2017	01/04/2020	Completed	N/A			N/A		2.2	14.2 15.1	No	N/A
3.1.3	Harnessing the science of social marketing in communication materials development and behaviour change for improved water quality in the GBR: a desktop review (Project 2.1.3 - Stage 2)	19,000	0	21,857	21,857	**40,857**	RPV3	01/01/2017	10/12/2017	Completed	N/A	N/A		N/A		2.3	14.2	No	N/A
3.1.4	Optimizing the management of riparian zones to improve the health of the Great Barrier Reef	178,491	0	177,372	177,372	**355,863**	RPV3	01/01/2017	30/06/2018	Completed	N/A	N/A		N/A		1.2	15.3	No	N/A
3.1.5	Ecotoxicology of pesticides on the Great Barrier Reef for guideline development and risk assessments	602,839	0	677,556	677,556	**1,280,395**	RPV3	01/01/2017	10/03/2020	Completed	N/A	N/A		N/A		2.3	12.4 14.1	No	N/A

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3.1.6	Exploring trading in water quality credits as a cost-effective approach for managing water quality in the Great Barrier Reef	316,837	160,000	254,170	414,170	**731,007**	RPV3	01/01/2017	10/03/2020	Ongoing	Delayed	N/A	Final report is submitted and currently under external peer-review with Gov OGBR	Minor	One week prior to submission of the final technical report on 30 September 2019, the project leader discovered a fault in the data formula. An extension was granted to 10 March 2020 to ensure all issues are resolved and the full peer-review takes place. The final report is being finalised afer a comprehensive external peer review process.	2.5	14.1	No	N/A
3.1.7	Reducing sediment loads to the Great Barrier Reef: developing optimal approaches for treating alluvial gully erosion	600,000	150,000	600,000	750,000	**1,350,000**	RPV3	01/01/2017	10/07/2020	Ongoing	Delayed	N/A	The project was approved an extension to 10 June 2020. The project is collecting another wet season of monitoring at the Strathalbyn site (funded by GA) - which started a year later than the Crocodile Station Site - and the extension would enable the inclusion of the data from one more wet season into the final analysis. The project will then have three wet seasons worth of data at each site. Incorporating this additional wet season data will ensure that the results published from the project will be that much more robust. A number of the rehabilitated gullies at Strathalbyn have only been subjected to a single wet season (albeit a very big one) since the works were completed, so a further wet season will enable the project to determine whether the very encouraging early trends are maintained. The extension will allow sufficient time to process and assimilate the 19/20 wet season data (particularly as the wet season may not even be over at that point).	N/A	An additional extension of one month has been approved by the Hub Leader to 10 July 2020. The project has been impacted by COVID-19 travel restrictions, but aims to drive up to north Queensland to collect the monitoring data during May 2020. The additional month will give time for a full analyses for reporting.	1.2	14.1	No	N/A
3.1.8	Innovative economic levers: a system for underwriting risk of practice change in cane-farming	400,000	0	404,330	404,330	**804,330**	RPV3	01/01/2017	10/03/2020	Completed	N/A			N/A		2.5	14.1	No	N/A
3.2.1	Deriving ecologically relevant load targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	497,765	31,513	739,177	770,690	**1,268,455**	RPV3	01/01/2017	30/03/2020	Completed	N/A	N/A	The Final Report has been submitted to the DAWE. There are a couple of minor edits to be made by the project leader at the request of the DAWE. The report will be uploaded by 30 October 2020.	N/A	The project has been impacted by COVID-19.	3.4	14.1	No	N/A

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3.2.2	The IMS 2050 Human Dimensions Project: cost-effective indicators and metrics for key GBRWHA human dimensions	150,000	0	187,650	187,650	**337,650**	RPV3	01/01/2017	28/01/2018	Completed	N/A	N/A		N/A		3.3	14.2	No	N/A
3.2.3	Monitoring aesthetic value of the Great Barrier Reef by using artificial intelligence to score photos and videos	99,028	30,000	179,275	209,275	**308,303**	RPV3	01/01/2017	28/01/2018	Completed	N/A	N/A		N/A		3.3	14.2	No	N/A
3.2.4	Defining, assessing and monitoring Great Barrier Reef aesthetics	105,336	0	116,057	116,057	**221,393**	RPV3	01/01/2017	10/12/2017	Completed	N/A	N/A		N/A		2b	14.2	No	N/A
3.2.5	Testing and implementation of the water quality metric for the 2017 and 2018 reef report cards	140,000	163,000	369,374	532,374	**672,374**	RPV3	01/01/2017	10/12/2017	Completed	N/A	N/A		N/A		3.3	14.2	No	N/A
3.3.1	Quantifying the linkages between water quality and the thermal tolerance of GBR coral reefs	590,264	0	590,400	590,400	**1,180,664**	RPV3	01/01/2017	01/06/2020	Ongoing	Delayed	N/A	An extension was approved to 1 June 2020. The DRAFT Final Report was received by the Hub on 23 July 2020 at the same time it was sent to external reviewers.	Minor	Workshop and presentations to stakeholders delayed. Zoom conferencing to take place in August/September to complete milestone. Covid related lab closures also delay the required Illumina MiSeq sequencing to identify Sybmiodiniaceae composition in field and experiment coral samples	2.1	14.2	No	N/A

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3.3.2	Science evaluation of coastal wetland systems repair projects across GBR catchments	536,932	0	682,867	682,867	**1,219,799**	RPV3	01/01/2017	10/03/2020	Ongoing	Delayed	N/A	Approved extension to 10 March 2020. The Hub is yet to receive the Final Reports which are udner external review.	N/A		3.4	14.2	No	N/A
3.3.3	Defining the values of the ecological systems that influence the GBR and lie outside the marine park and world heritage area boundaries	256,030	0	344,917	344,917	**600,947**	RPV3	01/02/2017	28/04/2018	Completed	N/A	N/A		Minor		3.4	14.2	No	N/A
4.1	Crown-of thorns starfish: surveillance and life history	497,500	0	553,770	553,770	**1,051,270**	RPV4	01/01/2018	10/09/2020	Ongoing	On Track	N/A		N/A		1.1	14.2	No	N/A
4.2	Oceanographic drivers of bleaching in the GBR: from observations to prediction	537,852	0	832,480	832,480	**1,370,332**	RPV4	01/01/2018	10/12/2020	Ongoing	Delayed	Delayed Milestone (COVID-19)	The COVID-19 pandemic resulted in a slight delay in obtaining the final sequencing results. Also impacted on ability to hire additional technical assistance due to immigration and Visa delays to manage and process the large volumes of sequencing data.	N/A		2	14.2	No	

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4.3	Best practice coral restoration for the Great Barrier Reef	607,000	6,000	776,000	782,000	**1,389,000**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	N/A		N/A		3	14.2	No	Marine
4.4	The traits of corals that survived recent bleaching events	582,218	0	713,276	713,276	**1,295,494**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	N/A		N/A	Project Leader has changed to Dr Kate Quigley, AIMS	3	14.2	No	N/A
4.5	Guidance system for resilience-based management of the Great Barrier Reef	638,037	140,256	558,579	698,835	**1,336,872**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	N/A	Presentation of the project results at conferences, which was intended in the original project contract, will not be possible before the end of the project due to conference cancellations (Covid 19)	N/A		1,2,3	14.2	No	N/A
4.6	Recommendations to maintaining functioning of the Great Barrier Reef	299,583	71,519	315,603	387,122	**686,705**	RPV4	01/01/2018	10/09/2019	Completed	N/A	N/A		N/A		1,2,3	14.2	No	N/A

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4.7	Indigenous coral reef tourism	100,000	0	200,000	200,000	**300,000**	RPV4	01/01/2018	30/10/2019	Completed	N/A	N/A		Minor		3.6	14.2	No	N/A
4.8	Project 25' Farmers, water quality and on-farm decision-making	600,000	0	600,000	600,000	**1,200,000**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	N/A	Some engagement and extension components are currently suspended but anticipated to be complete by project completion.	N/A		1,3	14.3	No	N/A
4.9	Gully characterisation framework to underpin GBR catchment water quality management	53,429	0	58,475	58,475	**111,904**	RPV4	01/01/2018	10/12/2018	Completed	N/A	N/A		N/A		1 2	14.3	No	N/A
4.10	Evaluating the Costs and Benefits of Agricultural Land Conversion to Wetlands	482,947	10,000	490,083	500,083	**983,030**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	Delayed Milestone (COVID-19)	Economic and Environmental field surveys delayed due to Covid19.	N/A		1 2	14.3	No	N/A
4.11	Sources, transformations and fate of particulate and dissolved organic carbon – implications for the GBR	26,470	8,830	93,239	102,069	**128,539**	RPV4	01/01/2018	10/12/2018	Completed	N/A	N/A		N/A		1	14.3	No	N/A

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4.12	Measuring cost-effectiveness and identifying key barriers and enablers of lasting behavioural change in the cane industry	404,985	28,800	446,671	475,471	**880,456**	RPV4	01/01/2018	10/12/2020	Ongoing	On Track	N/A		N/A		1.1 2.3	14.3	No	N/A
4.13	Assessing the Gulf of Carpentaria mangrove dieback	200,000	50,000	200,000	250,000	**450,000**	RPV4	01/06/2017	10/03/2020	Ongoing	Delayed	N/A	The final reports have been submitted and are currently being finalised by the NAER Hub as a joint-Hub publication.	N/A		1.1 1.2 2.1 4.1 5.1	14.2	Yes	NAER Hub
	Low budget projects	0	0	0	0	**0**	RPV4												
5.1	Matching the CoTS IPM to the scale of the new control program	494,360	13,600	505,460	519,060	**1,013,420**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	N/A		N/A		1	15.8	No	N/A
5.2	From exposure to risk: novel experimental approaches to analyze cumulative impacts and determine thresholds in the GBRWHA	120,000	0	193,052	193,052	**313,052**	RPV5	01/01/2019	30/06/2020	Ongoing	Delayed	N/A	Final report is submitted and currently under external peer-review with GBRMPA and QLD Gov OGBR	N/A		2	14.1	No	N/A
5.3	Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	137,350	0	164,461	164,461	**301,811**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	N/A		N/A		2	14.2	No	N/A
5.4	Deriving ecologically relevant targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	200,886	0	235,245	235,245	**436,131**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	Delayed Milestone (COVID-19)	Workshops require multi-institutional collaborations and training would ideally involve face to face communication. For these reasons, and primarily because of disruptions caused by COVID-19, these activities have been postponed. Focus has centred on data analysis until these items become feasible.	N/A		2	14.1	No	N/A

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5.5	Measuring aesthetic and experience values using Big Data approaches	237,216	20,000	263,991	283,991	**521,207**	RPV5	01/01/2019	30/09/2020	Ongoing	On Track	N/A		N/A		2	14.2	No	N/A
5.6	Designing the Aesthetics Long Term Monitoring Program (ALTMP)	149,743	0	150,631	150,631	**300,374**	RPV5	01/01/2019	30/06/2020	Completed	N/A	N/A		N/A		2	14.2	No	N/A
5.7	Assessment and communication of the spatial variability in bleaching severity throughout the Great Barrier Reef following back-to-back bleaching events in 2016 & 2017 (FAST TRACK PROJECT)	65,000	0	68,088	68,088	**133,088**	RPV5	31/09/2018	20/01/2020	Ongoing	Delayed	N/A		Significant	The final report has been submitted and is currently undergoing final internal review.	2	15.8	No	N/A
5.8	What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment and associated bioavailable nutrients	682,746	155,870	810,184	966,054	**1,648,800**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	Delayed Milestone (COVID-19)	Delays due to labwork impacted significantly by covid19. All field work is currently complete.	N/A		3	14.1	No	N/A
5.9	Gully remediation effectiveness	472,000	0	526,600	526,600	**998,600**	RPV5	01/01/2019	31/10/2020	Ongoing	On Track	N/A	The final Terrestrial Laser Scanner scans are important to capture the geomorphic changes over the 4 wet seasons. If this can be done in Aug/Sept/Oct confident that will be able to deliver everything in Dec. Worst case scenario if unable to get that data, will still have a good data set based on the 3 wet seasons of data.	N/A		3	14.1 15.3	No	N/A
5.10	Development and application of automated tools for high resolution gully mapping and classification from LiDAR data	357,297	89,324	275,148	364,472	**721,769**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	N/A		N/A		3	14.1 15.3	No	N/A
5.11	Improved Water Quality Outcomes from On-Farm Nitrogen Management	418,000	200,000	585,200	785,200	**1,203,200**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	N/A		N/A		3	14.1	No	N/A
5.12	Scoping land use conversion options for high DIN risk, low-lying sugarcane areas in Burdekin and Mackay Whitsunday regions	185,850	0	250,345	250,345	**436,195**	RPV5	01/01/2019	01/09/2020	Ongoing	On Track	N/A		N/A		3	14.1	No	N/A

Project Number/ID	Project Name/Title	Approved Funding Research Plan Versions 1-6 (This should match the NESP funding, other cash-contribution, and other in-kind contribution listed in RPV6 Attachment C.)					First Approved (Use dropdown)	Start Date	Completion Date	Status (Use dropdown)	Tracking# (Use dropdown)	COVID-19 Impact (Use dropdown)	Comment on project progress (Provide a brief explanation of any delays that have occurred, including the reasons for those delays and the action the Hub proposes to take to address these. Include in your response, the expected effects (if any) the delay will have on the project (including on subsequent milestones and overall completion of the project).	Changes from RPV6** (Use dropdown)	Changes from RPV6 (Provide a brief explanation of any significant** changes, or anticipated significant changes, to the project plan since it was last approved. You may also want to note any minor changes to projects such as changes to project team, changes <10% to budget, etc.)	NESP Research Priorities (Enter numbers/ID)	Sustainable Development Goals (SDG's) (Enter number)	Cross-Hub Collaboration (Yes/No)	List Hubs included in Collaboration (If applicable)
		NESP Funding* $	Other Cash Contributions* $	Other In-Kind Contributions* $	Total Other Contributions* $	Total Budget* $													
5.13	Coastal wetland systems repair across GBR catchments – Values Based Causal Framework validation	146,000	0	211,145	211,145	**357,145**	RPV5	01/09/2019	10/12/2020	Ongoing	On Track	N/A		N/A		3	14.2	No	N/A
5.14	Identifying the water quality and ecosystem health threats to the high diversity Torres Strait from the Fly River runoff	445,445	0	452,883	452,883	**898,328**	RPV5	01/01/2019	10/12/2020	Ongoing	On Track	Delayed Project (COVID-19)	The major 2020 field trip (28Mar-6Apr) and planned July trip to Boigu/Saibai were cancelled due to covid19 impacts. In addition, all laboratory work and analysis are on hold indefinitely. Some sampling fieldwork will take place in Oct in collaboration with AIMS installing a monitoring station. The project has held numerous discussions with the key end user, TSRA.	N/A		3	14.1	No	N/A
5.15	eAtlas extension: Data management for environmental research	217,000	0	333,947	333,947	**550,947**	RPV5	01/01/2019	01/03/2021	Ongoing	On Track	N/A		N/A		N/A	14.2	No	N/A
6.1	Innovations in COTS control on the GBR	150,000	0	150,000	150,000	**300,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				
6.2	Restoring ecosystems from catchment to reef	250,000	0	250,000	250,000	**500,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				
6.3	Reducing nitrogen runoff without reducing productivity	200,000	0	200,000	200,000	**400,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				
6.4	Reducing end-of-catchment fine sediment loads and ecosystem impacts	150,000	0	150,000	150,000	**300,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				
6.5	Improving coral condition through better-informed resilience-based management	200,000	0	200,000	200,000	**400,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				
6.6	Influencing agriculture practice behaviour change and trust frameworks	150,000	0	150,000	150,000	**300,000**	RPV6	01/01/2020	10/12/2020	New	On Track	Delayed Milestone (COVID-19)	Although the Inception workshop provided a consensus on the priorities for the scope and purpose of the project and the development of the Synthesis Report, the case studies are yet to be identified through a second workshop whcih has been delayed due to COVID-19.						
6.7	Learnings from applied environmental research programs: Elements for success	80,000	0	80,000	80,000	**160,000**	RPV6	01/01/2020	10/12/2020	New	On Track	N/A			The greatest challenge with these synthesis projects will be with the timing of finalisation of some of the input data and the completion of this synthesis project (many of the project final results are due at the same time). It is anticipated that products ready for peer review will be submitted in December 2020.				

Project Number/ID	Project Name/Title	Approved Funding Research Plan Versions 1-6 (This should match the NESP funding, other cash-contribution, and other in-kind contribution listed in RPV6 Attachment C.)					First Approved (Use dropdown)	Start Date	Completion Date	Status (Use dropdown)	Tracking# (Use dropdown)	COVID-19 Impact (Use dropdown)	Comment on project progress (Provide a brief explanation of any delays that have occurred, including the reasons for those delays and the action the Hub proposes to take to address these. Include in your response, the expected effects (if any) the delay will have on the project (including on subsequent milestones and overall completion of the project).	Changes from RPV6** (Use dropdown)	Changes from RPV6 (Provide a brief explanation of any significant** changes, or anticipated significant changes, to the project plan since it was last approved. You may also want to note any minor changes to projects such as changes to project team, changes <10% to budget, etc.)	NESP Research Priorities (Enter numbers/ID)	Sustainable Development Goals (SDG's) (Enter number)	Cross-Hub Collaboration (Yes/No)	List Hubs included in Collaboration (If applicable)
		NESP Funding* $	Other Cash Contributions* $	Other In-Kind Contributions* $	Total Other Contributions* $	Total Budget* $													
6.8	Integrated environmental assessment to inform environmental decisions	39,593	0	40,000	40,000	**79,593**	RPV6	01/10/2019	31/12/2020	New	Delayed	N/A			The project leader, Bendan Wintle has had an extension to June 2020 approved by the DAWE.				Threatened Species Recovery, Marine Biodiversity, Northern Australia, Tropical Water Quality, Earth Systems and Climate Change, Clean Air and Urban Landscapes Hubs
Total Project Costs		**25,490,283**	**2,131,922**	**31,314,020**	**33,445,942**	**58,936,225**													

On Track: The timeframes and milestones for the project are being met.
Delayed: The timeframes and milestones for the project are not being met.

* If you are collaborating with another Hub please only include your Hubs portion.

** Significant: includes changes ≥10% of total project costs, changes in scope that impact on the outputs, milestones delayed by more than 3 months, changes to final delivery dates, and changes to the Project Leader or Lead Organisation.
Minor: includes changes <10% of total project costs, delays in milestones of less than 3 months, and changes to project team (other than project leader).

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Outputs				
		Outputs (List outputs described in the project plan as well as any additional outputs the project delivered. Insert extra rows as needed)	**Is the output publicly available?**	**Date of publication or expected publication**	**Link to output**	**Comments on outputs** (Comment on any changes to planned output delivery, including changed, additional and non-delivery of outputs. Comments on data exemptions should also be included)
1.1	Establishing the future NESP CoTS research framework including an ecologically-based approach to the management of CoTS at multiple scales	Final Report - A Strategy to Link Research and Management of Crown-of-Thorns Starfish on the Great Barrier Reef: An Integrated Pest Management Approach	*Yes*	01/04/2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.1-FINAL-REPORT.pdf	The project team conducted a workshop (1-2 Sept, Townsville) attended by 24 researchers and managers from 11 institutions. Over two days at this workshop the project: 1) Developed a qualitative model of CoTS outbreaks at local, regional and GBR scales. 2) Developed a research strategy that incorporates this qualitative model to identify appropriate objectives for an IPM approach to CoTS management and from this key research gaps and research objectives for each stage of the outbreak. 3) These research objectives have been incorporated into a research plan for each phase of the NESP process, with the first scale (the local scale) the focus of the NESP2, and are being addressed collaboratively by the "CoTS Working Group" which comprises researchers and managers from AIMS, JCU, UQ, USyd, CSIRO, GBRMPA, QPWS, RRRC, and DotE.
1.2	Developing an approach to evaluate the effectiveness of investments in riparian management in the GBR catchments	Final Report Part A - Investing in riparian zone management to reduce erosion from stream channels: how do we evaluate success?	*Yes*	01/04/2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.2-PART-A-FINAL-REPORT.pdf	The original plan was for this project to focus on one dry tropical and one wet tropical region. The Burdekin was the first choice for the dry tropical region (as it is a hot-spot catchment), however, there were data sharing and privacy issues related to obtaining the location of previous investment/remediation sites in the Burdekin (i.e. they could not give specific lat and long data of riparian investment sites). The Fitzroy Basin were happy to share their riparian investment data with us, so switched focus catchments from the Burdekin to the Fitzroy. Both Terrain and Mackay Whitsundays (MWS) groups were willing to share their data, however, the MWS group provided data and information first, and given the large investment in riparian management and systems repair in this catchment, so chose to use the MWS (O'Connell Creek sites) as a 'wet tropics' case study.
		Final Report Part B - A comparison of tools for monitoring and evaluating channel change	*Yes*	01/04/2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.2-PART-B-FINAL-REPORT.pd	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-riparian-management-1-2	

1.3	A validation of coral geochemical records to reconstruct suspended sediment loads to the Great Barrier Reef lagoon	Final Report - An examination of the ability of coral geochemical records to reconstruct suspended sediment loads to the Great Barrier Reef lagoon	*Yes*	01/08/2016	http://nesptropical.edu.au/wp-content/uploads/2016/08/NESP-TWQ-1.3-FINAL-REPORT.pdf	Previous studies have speculated that the Ba/Ca, Y/Ca and Mn/Ca ratios in coral skeletons are related to land use change and sediment loading from adjacent river catchments to the GBR. A transect of coral cores collected from Magnetic Island, Havannah Island, Pandora Reef and Pelorus Island in August 2012 for the first time, directly examined the link between these trace element ratios in corals and measured sediment and particulate nutrient loads. These sites receive varying influence from the Burdekin River flood plume and provided an opportunity to compare the incorporation of trace elements in the corals from the different locations across single flood events. If a correlation could be established, this novel, independent technique would be able to quantify pre- and post-European suspended sediment loads to the GBR.
1.5	Legacy of the Lower Burdekin Water Quality Tender	Final Report - Ex-post evaluation of an environmental auction: Legacy of the 2008 Lower Burdekin Water Quality Tender	*Yes*	01/01/2016	http://nesptropical.edu.au/wp-content/uploads/2016/01/NESP-TWQ-1.5-FINAL-REPORT.pdf	
1.6	Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management	Final Report - Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management	*Yes*	01/08/2016	https://nesptropical.edu.au/wp-content/uploads/2016/08/NESP-TWQ-1.6-FINAL-REPORTA.pdf	
		Project Outcomes Factsheet - Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management	*Yes*	01/06/2016	https://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-Project-1.6-Factsheet-Outcomes.pdf	
1.7	Reducing sediment sources to the Reef: testing the effectiveness of managing alluvial gully erosion	Final Report - Reducing sediment sources to the Reef: Managing alluvial gully erosion	*Yes*	01/06/2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-1.7-FINAL-REPORT-COMPLETE-10-06-16.pdf	
1.8	Sub-catchment scale monitoring, modelling and extension design to support reef water quality improvement	Final Report - Sub-catchment scale monitoring, modelling and extension design to support reef water quality improvement in sugarcane catchments	*Yes*	01/07/2016	https://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-1.8-FINAL-REPORT-A.pdf	
1.9	The establishment of a future NESP dredging research investment framework	Final Report - The establishment of a future NESP dredging research investment framework	*Yes*	01/02/2016	https://nesptropical.edu.au/wp-content/uploads/2016/02/NESP-TWQ-1.9-FINAL-REPORT.pdf	
1.10	Identification, impacts, and prioritization of emerging contaminants present in the Great Barrier Reef and Torres Strait marine environments	Final Report - Identification, impacts, and prioritisation of emerging contaminants present in the GBR and Torres Strait marine environments	*Yes*	01/05/2016	https://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-1.10-FINAL-REPORTa.pdf	
2.1	Assessing the cumulative impacts of climatic disturbances on inshore GBR coral reefs, identifying key refuges and testing the viability of	Final Report - Assessing the cumulative impacts of climatic disturbances on coral reefs in the Keppel Islands, Great Barrier Reef Marine Park	*Yes*	01/05/2016	https://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-2.1-FINAL-REPORT.pdf	

	manipulative reef restoration	eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-inshore-reef-refuges-2-1	
2.2	A tradable permit scheme for cost effective reduction of nitrogen runoff in the sugarcane catchments of the Great Barrier Reef	Final Report - A tradable permit scheme for cost-effective reduction of nitrogen runoff in the sugarcane catchments of the Great Barrier Reef	*Yes*	01/04/2016	https://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-2.2-FINAL-REPORT.pdf	
3.1	Seagrass mapping synthesis – A resource for marine park and coastal management	NESP Science Day Presentation - Queensland tropical seagrass meadows	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-3.1-Lo.pdf	
		NESP Science Day Video - Status of seagrasses on the Great Barrier Reef	*Yes*	14/12/2017	https://youtu.be/x7KnbKIW3ds	
		Final Report - Seagrass mapping synthesis: A resource for coastal management in the Great Barrier Reef World Heritage Area	*Yes*	01/03/2016	https://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.1-FINAL-REPORT.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-seagrass-mapping-3-1	
		Dataset - Collation of spatial seagrass data (meadow extent polygons, species presence/absence points) from 1984 - 2014 for the Great Barrier Reef World Heritage Area (GBRWHA)	*Yes*	n/a	https://eatlas.org.au/data/uuid/77998615-bbab-4270-bcb1-96c46f56f85a	
3.2	Improving historical estimates of abundance and distribution of dugongs and large green turtles in western and central Torres Strait	Final Report - Working with the community to understand the use of space by dugongs and green turtles in Torres Strait	*Yes*	01/06/2016	https://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.2-FINAL-REPORT-1.pdf	
		Final Report - Improving the estimates of abundance of dugongs and large immature and adult-sized green turtles in Western and Central Torres Strait	*Yes*	01/06/2016	https://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.2-FINAL-REPORT-2.pdf	
3.3	Light thresholds for seagrasses of the GBR: a synthesis and guiding document for managing seagrass	Final Report - Light thresholds for seagrasses of the GBRWHA: a synthesis and guiding document Including knowledge gaps and future priorities	*Yes*	01/05/2016	https://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.3-FINAL-REPORTa.pdf	The project expanded to include an end-user consultation process (not originally specified in proposal). To accommodate this, the project end date was extended to 16 March 2016. The JCU project team presented the thresholds synthesis at GBRMPA, Townsville, and at the Ecosciences precinct in Brisbane in February 2016. Key stakeholders were asked to provide feedback on the approach, and final recommendations - which were incorporated into the final report as applicable. Invited stakeholders included staff from DISTIA, EHP, GBRMPA, CSIRO, DAF, Queensland Port Authorities, and the Department of the Environment.
3.4	Developing and refining biological indicators for seagrass condition assessments in an integrated monitoring program	Final Report - Developing and refining biological indicators for condition assessments in an integrated monitoring program	*Yes*	01/03/2016	https://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.4-FINAL-REPORT.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-seagrass-indicators-3-4	

3.5	Assessment of key dugong and turtle seagrass resources in the northern Torres Strait	Final Report - Assessment of Key Dugong and Turtle Seagrass Resources in North-west Torres Strait	*Yes*	01/04/2016	https://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-3.5-FINAL-REPORT.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/north-west-ts-seagrass-3-5	
		Dataset - Benthic survey of Dugong and Turtle seagrass habitats in the North-West Torres Strait for November 2015 and January 2016	*Yes*	n/a	https://eatlas.org.au/data/uuid/034ce816-0777-4bbd-aefc-8b73bd540245	
3.6	Establishing a research framework for future NESP investment into better understanding of the presence of Box-Jellyfishes (Irukandji) and risks in the Great Barrier Reef	Final Report - Establishing a research framework for future NESP investment into better understanding of the presence of Box-Jellyfishes (Irukandji) and risks in the Great Barrier Reef	*Yes*	01/03/2016	http://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.6-FINAL-REPORT.pdf	
		Journal Article - Empowering Stakeholders to Manage Stinging Jellyfish: A Perspective	*Yes*	01/04/2018	https://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.6-FINAL-REPORT.pdf	
3.7	Monitoring the effects of zoning on coral reefs and their associated fish communities in the GBR Marine Park	Final Report - Effects of marine park zoning on coral reefs of the Capricorn-Bunker Group	*Yes*	01/12/2015	https://nesptropical.edu.au/wp-content/uploads/2015/12/NESP-TWQ-3.7-FINAL-REPORT.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-zoning-3-7	
		Dataset - Results of benthic organisms, reef fishes and manta tow surveys of Capricorn Bunker reefs in October 2015	*Yes*	n/a	https://eatlas.org.au/data/uuid/1783f7ca-5abf-4b33-809f-ffe08c66703c	
3.8	Towards an integrated monitoring program: identifying indicators and existing monitoring programs to cost-effectively evaluate the Long Term Sustainability Plan	Final Report - Towards an integrated monitoring program: Identifying indicators and existing monitoring programs to effectively evaluate the Long Term Sustainability Plan	*Yes*	01/01/2016	https://nesptropical.edu.au/wp-content/uploads/2016/01/NESP-TWQ-3.8-FINAL-REPORT.pdf	
3.9	Indigenous capacity building and increased participation in management of Queensland sea country	Project Factsheet - Indigenous capacity building and increased participation in management of Queensland sea country	*Yes*	01/12/2015	https://nesptropical.edu.au/wp-content/uploads/2015/12/NESP-Project-3.9-Factsheet.pdf	
		Journal Article - Mapping cultural ecosystem services with rainforest aboriginal peoples: Integrating biocultural diversity, governance and social variation	*Yes*	01/06/2015	https://www.sciencedirect.com/science/article/pii/S2212041614001296	
		Journal Article - Participatory scenario planning in place-based social-ecological research: insights and experiences from 23 case studies	*Yes*	01/07/2015	https://www.ecologyandsociety.org/vol20/iss4/art32/	
		Journal Article - Collaboration mobilises institutions with scale-dependent comparative advantage in landscape-scale biodiversity conservation	*Yes*	01/08/2015	https://www.sciencedirect.com/science/article/pii/S1462901115000878	

		Journal Article - A social–ecological systems analysis of impediments to delivery of the Aichi 2020 Targets and potentially more effective pathways to the conservation of biodiversity	*Yes*	01/09/2015	https://www.sciencedirect.com/science/article/pii/S0959378015000576	
		Book Chapter - Governance for the conservation of nature	*Yes*	01/02/2016	https://nesptropical.edu.au/wp-content/uploads/2016/02/Borrini-Feyerabend_Hill2015.pdf	
		Final Report - Traditional Owners and Sea Country in the Southern Great Barrier Reef – Which Way Forward?	*Yes*	01/05/2016	https://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.9-FINAL-REPORT.pdf	
		Project Outcomes Factsheet - Indigenous capacity building and increased participation in sea country management: Project Results	*Yes*	01/06/2016	https://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.9-Factsheet-Outcomes.pdf	
3.10	Benchmarking costs of NRM improvements for the GBR	Final Report - Benchmarking costs of improving agricultural water management in GBR catchments	*Yes*	01/03/2016	https://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.10-FINAL-REPORT.pdf	
3.11	Monitoring and adaptively reducing system-wide governance risks facing the GBR	Final Report - Monitoring and adaptively reducing system-wide governance risks facing the GBR	*Yes*	01/05/2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.11-FINAL-REPORT.pdf	
3.12	Development of an offset financial contribution calculator for Reef Trust	Final Report - Reef Trust Offsets Calculator: A prototype calculation approach for determining financial liability for marine biodiversity offsets voluntarily delivered through the Australian Government Department of the Environment (Reef Trust)	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-3.12-FINAL-REPORTa.pd	
3.13	eAtlas 2015 - NESP data management, Torres Strait NRM plan delivery platform and Torres Strait reef mapping	Final Report - Mapping the Torres Strait Reef and Island Features Extending the GBR Features (GBRMPA) dataset	*Yes*	01/05/2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.13-FINAL-REPORT-1.pdf	
		Final Report - Highlights of the National Environmental Research Program Tropical Ecosystems (NERP TE) Hub datasets eAtlas Metadata Catalogue 2011-2014	*Yes*	01/05/2016	https://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.13-FINAL-REPORT-2.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-1/gbr-eatlas-ts-mapping-3-13	
		Dataset - Complete Great Barrier Reef (GBR) Island and Reef Feature boundaries including Torres Strait Version 1b	*Yes*	n/a	https://eatlas.org.au/data/uuid/d2396b2c-68d4-4f4b-aab0-52f7bc4a81f5	

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Outputs				
		Outputs (List outputs described in the project plan as well as any additional outputs the project delivered. Insert extra rows as needed)	**Is the output publicly available?**	**Date of publication or expected publication**	**Link to output**	**Comments on outputs** (Comment on any changes to planned output delivery, including changed, additional and non-delivery of outputs. Comments on data exemptions should also be included)
2.1.1	Integrated Pest Management of Crown-of-Thorns Starfish	•Review paper outlining preliminary ecologically-informed CoTS local-scale control strategy for individual reef sites (December 2016) •Report detailing refined ecologically-informed CoTS local-scale control strategy and rules of thumb for individual reef sites (December 2017) •Phone, tablet or PC-based field-deployable Decision Support Tool (December 2018) •Report and data describing detailed juvenile, sub-adult and adult surveys of key reefs (December 2017 and 2018) •Report and data describing CoTS adult movement data (December 2016 and 2017) •Report detailing the impact of CoTS predators, through a review of Green and Blue Zones, and a review of research into triton (December 2016) •Report outlining results of tests of eDNA for surveillance and recommendations based on these				
		Project Factsheet - Integrated Pest Management of Crown-of-Thorns Starfish	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.1-Factsheeta.pdf	
		Interim Report - Strategies for Surveillance and Control: Using Crown-of-Thorns Starfish management program data to optimally distribute management resources between surveillance and control	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-2.1.1-INTERIM-REPORT-1.pdf	

		Technical Report - The potential role of the giant triton snail, Charonia tritonis (Gastropoda: Ranellidae) in mitigating populations of the crown-of-thorns starfish	*Yes*	01/05/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/NESP-TWQ-2.1.1-TECHNICAL-REPORT-1b.pdf	
		Journal Article - Body size and substrate type modulate movement by the western Pacific crown-of-thorns starfish, *Acanthaster solaris*	*Yes*	01/05/2018	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180805	
		Journal Article - eDNA detection of corallivorous seastar (Acanthaster cf. solaris) outbreaks on the Great Barrier Reef using digital droplet PCR	*Yes*	01/09/2018	https://link.springer.com/article/10.1007%2Fs00338-018-1734-6	
		Technical Report - Do no-take zones reduce the likelihood of outbreaks of the Crown-of-thorns starfish?	*Yes*	01/11/2018	https://nesptropical.edu.au/wp-content/uploads/2018/11/NESP-TWQ-2.1.1-TECHNICAL-REPORT-2-.pdf	
		Synthesis Report - Identifying water quality and ecosystem health threats to the Torres Strait from runoff arising from mine-derived pollution of the Fly River	*Yes*	01/08/2018	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-2.2.1-2.2.2-Synthesis-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/cots-pest-management-2-1-1	
2.1.2	Scoping options for low-lying, marginal cane land to reduce DIN in priority wet tropics catchments	• Map showing low-lying, marginal cane land in the priority wet tropics catchments. This will be compatible with other platforms and provided for use by Terrain NRM, local, state and federal Government and other stakeholders. • At-source cost/benefit curves that outline water quality improvement and ecosystem service benefits for alternative land uses. The economic assessment will also quantify potential future income streams such as carbon, water quality credits and rate rebate options. • Report detailing the constraints and opportunities and cost/benefits of alternative land uses in priority wet tropics catchments.				
		Project Factsheet - Scoping options for low lying, marginal cane land to reduce DIN in priority wet tropics catchments	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.2-Factsheet.pdf	
		Final Report - Scoping land conversion options for high DIN risk, low-lying sugarcane, to alternative use for water quality improvement in Wet Tropics catchments	*Yes*	08/04/2018	https://nesptropical.edu.au/wp-content/uploads/2020/06/NESP-TWQ-Project-2.1.2-Final-Report.pdf	

		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/scoping-low-lying-marginal-cane-land-2-1-2	
2.1.3	Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: an action research project	Planned outputs include •Three 'factsheets' - one produced relatively early in the life of the project which outlines key objectives and proposed methods (including identification of programmes that will be evaluated as part of the research); one part way through the project, providing an 'update' of insights gleaned; a final one at the end summarising key findings and impacts. •Marketing materials/strategy guidelines and templates, including readability assessment tools and message framing guidelines to support the roll out of Programme X (the programme selected for focused research support and adaption). •A final report •Journal articles and conference papers				
		Project Factsheet - Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: an action research project	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/12/NESP-TWQ-Project-2.1.3-Factsheetb.pdf	
		Interim Report 1 - Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: Background review of literature	*Yes*	11/01/2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.1.3-INTERIM-REPORT-1.pdf	
		Interim Report 2 - Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: A documentary analysis of Reef Trust Tender (Burdekin) and Reef Programme	*Yes*	11/01/2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.1.3-INTERIM-REPORT-2.pdf	
		Interim Report 3 - Questionnaire Design, Sampling Strategy and Preliminary Findings: The Burdekin region.	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-2.1.3-INTERIM-REPORT-3.pdf	
		Interim Report 4 - Questionnaire Design, Sampling Strategy and Preliminary Findings: The Wet Tropics region	*Yes*	02/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-2.1.3-INTERIM-REPORT-4.pdf	
		Interim Report 5 - Questionnaire Design, Sampling Strategy and Preliminary Findings: A Comparison of the Burdekin and Wet Tropics regions	*Yes*	02/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-2.1.3-INTERIM-REPORT-5.pdf	
		Journal Article - Competing and conflicting messages via online news media: potential impacts of claims that the Great Barrier Reef is dying.	*Yes*	01/07/2018	https://www.sciencedirect.com/science/article/abs/pii/S0964569117307949?via%3Dihub	

		Survey Info Sheet - Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: an action research project	*Yes*	16/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-2.1.3-Info-Sheet.pdf	
		Interim Report 6 - Key Determinants of Pro-environmental Behaviour of Land Managers in the Agricultural Sector: Literature Review	*Yes*	17/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-2.1.3-INTERIM-REPORT-6.pdf	
		Interim Report 7 - Land Managers Decision Making about Water Quality: Views from Extension Officers of the Wet Tropics, Queensland, Australia	*Yes*	09/04/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-2.1.3-INTERIM-REPORT-7.pdf	
		Journal Article - Social Marketing's role in improving water quality on the Great Barrier Reef	*Yes*	30/05/2019	https://www.emerald.com/insight/content/doi/10.1108/APJML-08-2018-0318/full/html	
		Final Report - Findings from a longitudinal study of farmer decision influences for Best Management Practices, Queensland, Australia	*Yes*	08/01/2020	https://nesptropical.edu.au/wp-content/uploads/2020/01/NESP-TWQ-Project-2.1.3-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/social-marketing-for-improved-wq-2-1-3	
2.1.4	Demonstration and evaluation of gully remediation on downstream water quality and agricultural production in GBR rangelands	The Planned outputs from this project include: • Reporting on the effectiveness (in terms of cover, erosion and water quality) of various gully remediation approaches in the Burdekin catchment • Reporting on the cost of various gully remediation approaches implemented (which will include site maintenance etc)				
		Project Factsheet - Demonstration and evaluation of gully remediation on downstream water quality and agricultural production in GBR rangelands	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.4-Factsheet.pdf	
		Technical Report - Quantifying the effectiveness of gully remediation on off-site water quality: preliminary results from demonstration sites in the Burdekin catchment	*Yes*	31/10/2017	http://nesptropical.edu.au/wp-content/uploads/2017/10/NESP-TWQ-2.1.4-TECHNICAL-REPORT-1.pdf	
		NESP Science Day Presentation - Quantifying the effectiveness of gully remediation on off-site water quality: preliminary results from demonstration sites in the Burdekin catchment	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.1.4-Lo.pdf	

NESP Science Day Video - Quantifying the effectiveness of gully remediation on off-site water quality: preliminary results from demonstration sites in the Burdekin catchment	*Yes*	14/12/2017	https://youtu.be/3UN6PT5N9gA
Journal Article - Characterisation of the hydrological response to rainfall at multi spatio-temporal scales in savannas of semi-arid Australia. Water.	*Yes*	13/06/2017	https://www.mdpi.com/2073-4441/9/7/540
Journal Article - Assessment of UAV and ground-based Structure from Motion with Multi-View Stereo photogrammetry in a gullied savanna catchment. International Journal of Geo-Information.	*Yes*	30/10/2017	http://www.mdpi.com/2220-9964/6/11/328/htm
Technical Report - Quantifying the effectiveness of gully remediation on off-site water quality: Preliminary results from demonstration sites in the Burdekin catchment (second wet season)	*Yes*	25/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-2.1.4-TECHNICAL-REPORT-2.pdf
Journal Article - Colloidal nitrogen is an important and highly-mobile form of nitrogen discharging into the Great Barrier lagoon	*Yes*	27/08/2018	https://www.nature.com/articles/s41598-018-31115-z
Journal Article - Fine sediment and particulate organic matter: A review and case study on ridge-to-reef transport, transformations, fates, and impacts on marine ecosystems	*Yes*	01/10/2018	https://www.sciencedirect.com/science/article/pii/S0025326X18305678?via%3Dihub
E-newsletter article - View on TWQ October 2018	*Yes*	05/10/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/october-2018/
Technical Report - Cost effectiveness of gully remediation in the Burdekin catchment: preliminary insights based on measured data from monitoring sites	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-2.1.4-TECHNICAL-REPORT-3.pdf
Journal Article - Characterisation of Hydrological Responses to Rainfall at Multi-Spatio-Temporal Scales in Savannas of Semi-arid Australia	*Yes*	02/05/2019	https://www.mdpi.com/2073-4441/9/7/540
Journal Article - Grazing Impacts on Gully Dynamics indicate approaches for gully erosion control in northeast Australia	*Yes*	02/05/2019	https://onlinelibrary.wiley.com/doi/abs/10.1002/esp.4339
Journal Article - Making management decisions in the face of uncertainty: a case study using the Burdekin catchment in the Great Barrier Reef	*Yes*	02/05/2019	https://www.publish.csiro.au/mf/MF17237
eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/gully-remediation-effectiveness-2-1-4

2.1.5	What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment	• The project outcomes will be communicated through progress reports, a technical report, conceptual models and peer-reviewed publications. • With the assistance of the Knowledge Transfer component of the TWQ hub, other outputs such as the construction of conceptual diagrams, fact sheets and media releases will be developed as a further communication strategy for the research				
		Media release - Water quality researchers track flood plume heading toward Great Barrier Reef	*Yes*	26/03/2016	https://nesptropical.edu.au/wp-content/uploads/2018/03/Water-Quality-scientists-track-flood-plume-heading-toward-Great-Barrier-Reef-after-north-Queensland-rains.pdf	
		Project Factsheet - What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.5-Factsheet.pdf	
		E-newsletter Article - View on TWQ May 2018	*Yes*	15/05/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/may-2018/	
		Journal Article - A critical evaluation of coral Ba/Ca, Mn/Ca and Y/Ca ratios as indicators of terrestrial input: New data from the Great Barrier Reef, Australia	*Yes*	24/07/2018	https://www.sciencedirect.com/science/article/abs/pii/S0016703718303326?via%3Dihub	
		Journal Article - Fine sediment and particulate organic matter: A review and case study on ridge-to-reef transport, transformations, fates, and impacts on marine ecosystems	*Yes*	26/09/2018	https://www.sciencedirect.com/science/article/abs/pii/S0025326X18305678?via%3Dihub	
		Journal Article - A novel approach of combining isotopic and geochemical signatures to differentiate the sources of sediments and particulate nutrients from different land uses	*Yes*	12/12/2018	https://www.sciencedirect.com/science/article/abs/pii/S004896971834436X?via%3Dihub	
		Final Report - Sediment tracing from the catchment to reef 2016 to 2018: Flood plume, marine sediment trap and logger data time series.	*Yes*	30/04/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-2.1.5-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/origin-detrimental-sediment-2-1-5	

2.1.6	From exposure to risk: novel experimental approaches to analyze cumulative impacts and determine thresholds in the GBRWHA	This project will produce a number of reports and publications, conference presentations, and material for fact sheets and reviews. It will also produce a range of datasets from the experimental work, and analyses of cumulative impacts for selected field sites. These outputs will be communicated to GBRMPA, the Department of the Environment and to the Queensland Office of the GBR on a six-monthly basis.				The final datasets have been published on the eAtlas: Cumulative effects of suspended sediments, temperature and nutrient enrichment on the early stages of development of Acropora tenuis (NESP TWQ 2.1.6, AIMS) Physiological effects of climate change and diuron on calcareous algae Halimeda opuntia (NESP 2.1.6, AIMS) Effects of climate change and the herbicide diuron on Photosystem II activity of the tropical seagrass Halophila ovalis (NESP 2.1.6, AIMS) Cumulative effects of suspended sediments and climate change on coral development prior to settlement (NESP 2.1.6, AIMS, JCU and AIMS@JCU) Cumulative Effects of Nutrient Enrichment and Elevated Temperature Compromise the Early Life History Stages of the Coral Acropora tenuis (NERP TE 5.2 and NESP TWQ 2.1.6, AIMS and JCU) eAtlas Project site: https://eatlas.org.au/nesp-twq-2/gbr-cumulative-impacts-2-1-6 NESP TWQ Hub Project site: https://nesptropical.edu.au/index.php/round-2-projects/project-2-1-6/
		Project Factsheet - From exposure to risk: novel experimental approaches to analyse cumulative impacts and determine thresholds in the GBRWHA	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.6-Factsheet.pdf	
		Journal Article - Cumulative Effects of Nutrient Enrichment and Elevated Temperature Compromise the Early Life History Stages of the Coral Acropora tenuis	*Yes*	30/08/2016	http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161616	
		Journal Article - Model fit versus biological relevance: Evaluating photosynthesis-temperature models for three tropical seagrass species	*Yes*	04/01/2017	https://www.nature.com/articles/srep39930	
		Journal Article - Optimum Temperatures for Net Primary Productivity of Three Tropical Seagrass Species.	*Yes*	23/08/2017	https://www.frontiersin.org/articles/10.3389/fpls.2017.01446/full	
		NESP TWQ Science Day Presentation - From exposure to risk: novel experimental approaches to analyse cumulative impacts and determine thresholds in the GBRWHA	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.1.6-Lo.pdf	
		Journal Article - Losing a winner: thermal stress and local pressures outweigh the positive effects of ocean acidification for tropical seagrasses	*Yes*	09/04/2018	https://nph.onlinelibrary.wiley.com/doi/10.1111/nph.15234	
		Journal Article - Optimum Temperatures for Net Primary Productivity of Three Tropical Seagrass Species	*Yes*	09/04/2018	https://www.frontiersin.org/articles/10.3389/fpls.2017.01446/full	
		Journal Article - Coral Reefs Under Climate Change and Ocean Acidification: Challenges and Opportunities for Management and Policy	*Yes*	09/04/2018	https://www.annualreviews.org/doi/full/10.1146/annurev-environ-110615-085610	
		Journal Article - Fine sediment and particulate organic matter: A review and case study on ridge-to-reef transport, transformations, fates, and impacts on marine ecosystems	*Yes*	26/09/2018	https://www.sciencedirect.com/science/article/pii/S0025326X18305678?via%3Dihub	

		Final Interim Technical Report - Applying climate adjustments to tropical water quality guidelines	*Yes*	15/12/19	https://nesptropical.edu.au/wp-content/uploads/2019/12/NESP-TWQ-Project-2.1.6-5.2-Technical-Report-1.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/gbr-cumulative-impacts-2-1-6	
		Dataset - Cumulative effects of suspended sediments, temperature and nutrient enrichment on the early stages of development of Acropora tenuis (NESP TWQ 2.1.6, AIMS)	*Yes*	n/a	https://eatlas.org.au/data/uuid/921d81ce-2319-469b-bb4e-0cecabdfc899	
		Dataset - Cumulative Effects of Nutrient Enrichment and Elevated Temperature Compromise the Early Life History Stages of the Coral Acropora tenuis	*Yes*	n/a	https://eatlas.org.au/data/uuid/c2d91a7e-9e9d-415b-8d56-b93faeb5cd73	
		Dataset - Cumulative effects of suspended sediments and climate change on coral development prior to settlement	*Yes*	n/a	https://eatlas.org.au/data/uuid/7113188f-a9fc-4df8-baa5-98d5cf9ec959	
		Dataset - Physiological effects of climate change and diuron on calcareous algae Halimeda opuntia	*Yes*	n/a	https://eatlas.org.au/data/uuid/f3da9a0a-a9e3-49e3-a0c3-4c55ddb57988	
		Dataset - Effects of climate change and the herbicide diuron on Photosystem II activity of the tropical seagrass Halophila ovalis	*Yes*	n/a	https://eatlas.org.au/data/uuid/f6636322-28d9-47fe-878d-0e70cc7c6920	
2.1.7	Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making	• The project outcomes will be communicated through progress reports, technical reports, conceptual models and peer-reviewed publications • With the assistance of the Knowledge Transfer component of the TWQ hub, other outputs such as the construction of conceptual diagrams, fact sheets and media releases will be developed as a further communication strategy for the research outputs.				
		Project Factsheet - Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.7-Factsheet.pdf	
		Magazine Article (Canegrowers Magazine) - Project 25 Putting the future of water quality back in growers' hands	*Yes*	18/07/2016	https://issuu.com/canegrowers0/docs/2016-07-18_australian_canegrower_-_/7	
		Project Video - Scientists and Farmers working together for Great Barrier Reef water quality	*Yes*	31/08/2016	https://youtu.be/cuslOI8RD9o	

		NESP Science Day Presentation - “Project 25” - farmers, water quality and on-farm decision-making	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.1.7-Lo.pdf	
		NESP Science Day Video - Farmers, water quality and on-farm decision-making (Project 25)	*Yes*	14/12/2017	https://youtu.be/lwCm-eztCXM	
		E-newsletter article - View on TWQ Feb 2018	*Yes*	20/02/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/february-2018/	
		Magazine Article (Canegrowers Magazine) - Growers gain valuable insight into water quality monitoring projects	*Yes*	12/03/2018	https://issuu.com/canegrowers0/docs/2018-03-12-australiancanegrower/20	
		Project Video - Project 25: CANEGROWERS Environment Board tour	*Yes*	14/03/2018	https://youtu.be/HAc6a1sEgXg	
		Media Release - Nitrogen forum brings water quality scientists and cane farmers together	*Yes*	06/11/2018	https://nesptropical.edu.au/wp-content/uploads/2019/05/Nitrogen-forum-brings-scientists-and-cane-farmers-together.pdf	
		Final Report - Utility of emerging sensing technologies as a water quality engagement tool with agricultural producers: An interim report for NESP Project 2.1.8 – Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making (“Project 25”).	*Yes*	18/01/2020	https://nesptropical.edu.au/wp-content/uploads/2020/01/NESP-TWQ-Project-2.1.7-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/engaging-farmers-wq-2-1-7	
2.1.8	Improved water quality outcomes from on-farm nitrogen management	• All datasets produced during the project will be uploaded onto the SSIMR (DSITI) corporate information system and made accessible to all project team members. The final technical report of the project will have, as an attachment, a metadata index indicating where project data are located. • Project data will comprise individual site details and records, and collated datasets for input into the models (APSIM/How Leaky) and decision support tools (SafeGauge for Nutrients). • The project outcomes will be communicated through progress reports, the final technical report and peer-reviewed publications.				The final interim technical report is complete. Published 1.08.19
		Project Factsheet - Improved Water Quality Outcomes from On-Farm Nitrogen Management	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.8-Factsheet.pdf	

		Media Release - New fertilizers to protect Reef and farm profitability	*Yes*	26/09/2016	http://nesptropical.edu.au/wp-content/uploads/2017/01/New-Fertilizers-to-protect-Reef-farm-profitability-Project-2.1.8.pdf	
		Conference Presentation - Tracking nitrogen from the paddock to the reef - a case study from the Great Barrier Reef	*Yes*	16/01/2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/INI2016_Bell_Michael_PRESENTATION.pdf	
		NESP TWQ Science Day Presentation - Using production unit yield potential and enhanced efficiency fertilisers to improve the efficiency of sugarcane N use	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.1.8-Lo.pdf	
		NESP TWQ Science Day Video - Enhanced efficiency fertilizers for improved water quality	*Yes*	14/12/2017	https://youtu.be/RRy284Z58aY	
		E-newsletter article - View on TWQ October 2018	*Yes*	05/10/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/october-2018/	
		Journal Article - Biochemical effects of banding limit the benefits of nitrification inhibition and controlled-release technology in the fertosphere of high N-input systems	*Yes*	20/12/2018	https://www.publish.csiro.au/sr/SR18211	
		Final Report - Improved Water Quality Outcomes from On-Farm Nitrogen Management	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-2.1.8-Final-Report.pdf	
		Peer Reviewed Paper - Can new fertilizer technology facilitate a reduction in fertilizer-N rates and improved water quality without compromising sugar production?	*Yes*	26/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/Bell-Moody-Skocaj-Masters-Fries-Dowie.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/qld-on-farm-nitrogen-management-2-1-8	
2.1.9	Risk assessing dredging activities	Planned Outputs include scientific papers, algorithms for spectral light changes, websites including photographs and videos managed with metadata. Technical reports/synthesis Media releases				
		Project Factsheet - Risk assessing dredging activities	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.1.9-Factsheet.pdf	
		Journal Article - Continuous in situ monitoring of sediment deposition in shallow benthic environments	*Yes*	20/01/2017	https://link.springer.com/article/10.1007/s00338-016-1536-7	
		Journal Article - Coral morphology and sedimentation	*Yes*	01/08/2017	https://www.sciencedirect.com/science/article/pii/S0025326X17307063?via%3Dihub	

		Journal Article - Sediment characteristics influence the fertilisation success of the corals Acropora tenuis and Acropora millepora	*Yes*	21/08/2019	https://www.sciencedirect.com/science/article/pii/S0025326X18305654?via%3Dihub	
		Final Report - Risk Assessing Dredging Activities in Shallow-Water Mesophotic Reefs	*Yes*	18/03/2020	https://nesptropical.edu.au/wp-content/uploads/2020/03/NESP-TWQ-Project-2.1.9-Final-Report.pdf	
		Jounral Article - Effects of sediment resuspension on the larval stage of the model sponge Carteriospongia foliascens	*Yes*	24/04/2020	https://www.sciencedirect.com/science/article/abs/pii/S0048969719337842?via%3Dihub	
		Journal Article - Responses of corals to chronic turbidity	*Yes*	24/04/2020	https://go.nature.com/2VP3FDM	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/risk-assessing-dredging-activities-2-1-9	
2.1.10	The application and adaptation of mine site rehabilitation approaches to alluvial gully rehabilitation in the Bowen Catchment	• Communication materials (Youtube videos; media stories; plain English community outreach materials/factsheets) • Concept plans for large scale rehabilitation demonstration projects on at least 2 separate sites within the broader study area • An implementation plan for the demonstration sites, including consideration of commitments for cash and in-kind support from the project partners. • Collation of all existing baseline data for the identified sites – including datasets held by the mining companies • A detailed monitoring strategy for the demonstration project sites.				
		Project Factsheet - The application and adaption of mine site rehabilitation approaches to alluvial gully rehabilitation in the Bowen Catchment	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.1.10-Factsheet.pdf	
		Communique 1 - Alluvial Gully Systems Erosion Control & Rehabilitation Workshop, Collinsville 8-10 August 2016	*Yes*	01/10/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/Project-2-1-10-COMMUNIQUE-Collinsville-Alluvial-Gully-Workshop-COMPLETE.pdf	
		eAtlas Project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/gbr-gully-rehabilitation-2-1-10	

2.2.1	Identifying the water quality and ecosystem health threats to the high diversity Torres Strait and Far Northern GBR from runoff from the Fly River	Expected outputs based on the project components: Review of existing knowledge: • Synthesis report on Fly River discharge plume behaviors in the Gulf of Papua and northern Torres Strait, and condition of receiving environments. Monitoring and modeling Fly River plumes: • Develop maps of estimated extent of plume intrusions • Visualisation of plume movement • Further development of available modelling tools • Incorporation of data into TS eAtlas Overall: • Final project report detailing the results of the project, including management recommendations and priorities for further investigations. Final Report: Due 30 May 2018				
		Project Factsheet - Identifying the water quality and ecosystem health threats to the high diversity Torres Strait and Far Northern GBR from runoff from the Fly River	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.2.1-2.2.2-Factsheet.pdf	
		Interim Report - Coral Core Records of the North-East Torres Strait	*Yes*	18/01/2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.2.1-INTERIM-REPORT-1.pdf	
		NESP TWQ Science Day Presentation - Influence of the Fly River on the Torres Strait	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.2.1-and-2.2.2-Lo.pdf	
		Journal Article - Sensitivity analysis of the physical dynamics of the Fly River plume in Torres Strait	*Yes*	01/09/2018	https://www.sciencedirect.com/science/article/abs/pii/S0272771416307296?via%3Dihub	
		Poster - Identifying water quality and ecosystem health threats to the Torres Strait from runoff arising from mine-derived pollution of the Fly River	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-2.2.1-2.2.2-Map-Poster.pdf	
		Final Report - Identifying water quality and ecosystem health threats to the Torres Strait and Far Northern GBR arising from runoff of the Fly River	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2019/07/NESP-Project-2.2.1-Final-Report.pdf	

		Joint Summary Report - Identifying water quality and ecosystem health threats to the Torres Strait from runoff arising from mine-derived pollution of the Fly River. Synthesis Report for NESP TWQ Hub Project 2.2.1 and NESP TWQ Hub Project 2.2.2	*Yes*	15/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-2.2.1-2.2.2-Synthesis-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/ts-water-quality-2-2-1	
2.2.2	Impacts of mine-derived pollution on Torres Strait environments and communities	• A final report will be prepared towards the end of the project and made publically-available via web download. • At least three conference presentations at local and international conferences • It is envisaged that there will be at least three peer reviewed journal publications • Regular information sheets (one per year) will be prepared with the assistance of the CSIRO communications team. These will be available for download from the CSIRO, NESP TWQ Hub and eAtlas websites. Hard copies will be provided to the TSRA for distribution to local communities. • Regular contributions to the Tropical Water Quality Hub newsletter • A mid-project and end-of-project workshop will be held at a suitable location in the Torres Strait with a view to updating local stakeholders on project progress.				
		Project Factsheet - Impacts of mine-derived pollution on Torres Strait environments and communities	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.2.1-2.2.2-Factsheet.pdf	
		NESP TWQ Science Day Presentation - Influence of the Fly River on the Torres Strait	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.2.1-and-2.2.2-Lo.pdf	
		Poster - Identifying water quality and ecosystem health threats to the Torres Strait from runoff arising from mine-derived pollution of the Fly River	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-2.2.1-2.2.2-Map-Poster.pdf	
		Joint Summary Report - Identifying water quality and ecosystem health threats to the Torres Strait from runoff arising from mine-derived pollution of the Fly River. Synthesis Report for NESP TWQ Hub Project 2.2.1 and NESP TWQ Hub Project 2.2.2	*Yes*	15/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-2.2.1-2.2.2-Synthesis-Report.pdf	

		Final Report - Impacts of minde-derived contaminants on Torres Strait environments and communities	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-Project-2.2.2-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/ts-mine-pollution-2-2-2	
2.2.3	Early warning systems to minimize the risk of box jellyfish stings by empowering stakeholders	• Robust early warning system for empowering stakeholders to forecast the risk of jellyfish stings; • The Venomous Jellyfish Database will be (in the public domain) used to build forecasting models and can be used to increase our understanding of jellyfish ecology; • Irukandji and stinger forecast models for sting hotspots at the three focal areas (FNQ beaches, FNQ reefs and islands, and Magnetic Island); • Real-time forecasts of predicted sting events at sting hotspots; • Identified stakeholder management needs, potential actions, and the most effective modes of delivery for our forecasting system based on stakeholder engagement; • Information sessions with stakeholders; • Greater understanding of the influence of water quality and associated factors on stinger/Irukandji occurrences.				
		Project Factsheet - Early warning systems to minimize the risk of box jellyfish stings by empowering stakeholders	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.2.3-Factsheet.pdf	
		Dataset - Venomous Jellyfish Database	*Yes*	23/10/2017	http://eatlas.org.au/data/uuid/09311b48-e6f1-484f-945b-8a5b5bfba232	
		Final Report - Early warning systems to minimize the risk of boz jellyfish stings by empowering stakeholders	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-2.2.3-Final-Report.pdf	
		Dataset - R Code for analysis of Irukandji data of the GBR	*Yes*	01/01/2019	https://eatlas.org.au/data/uuid/c5ce8cb6-04e5-4153-836d-df91878a3131	
		Dataset - Venomous Jellyfish Database (Sting events and specimen samples)	*Yes*	01/01/2019	https://eatlas.org.au/data/uuid/09311b48-e6f1-484f-945b-8a5b5bfba232	
		Dataset - Venomous Jellyfish Database (sting events and specimen samples – November 2018)	*Yes*	24/01/2019	https://eatlas.org.au/data/uuid/16904861-53e6-4123-a7bb-781f2429629f	

		Journal Article - Extreme, but not moderate climate scenarios impart sublethal effects on polyps of the Irukanji jellyfish, Carukia Barnesi	*Yes*	01/06/2019	https://www.sciencedirect.com/science/article/abs/pii/S0048969719325112?via%3Dihub	
		Project Factsheet - Risk of Irukanji stings in northeast Australia	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-2.2.3-Irukandji-Factsheet.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/jellyfish-early-warning-2-2-3	
2.3.1	Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	• A WQI as a reporting metric using benthic light availability, with well-defined drivers and thresholds applicable to coral health, seagrass, and ecological health indicators reported by MMP. • Incorporation of the developed bPAR algorithm into NASA's SeaDAS processing software, as an operational algorithm freely available to the scientific community. • Data on in-situ PAR measurements from the IMOS stations will be made freely available to the scientific community. • Data sets (netCDF format: monthly mean climatologies of benthic irradiance), metadata and maps of benthic irradiance (climatologies and monthly means), and cumulative pressures overlay with temperature, will be distributed through the eAtlas. • Scientific reports and publications on the use of benthic irradiance as a WQI for the GBR; • Scientific reports and publications on light requirements and thresholds for reef organisms and ecosystems.				
		Project Factsheet - Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	*Yes*	01/10/2016	https://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.1-Factsheet.pdf	
		NESP Science Day Presentation - Every bucket counts: New insights into the role of water clarity for the health of the GBR	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.3.1-Lo.pdf	
		NESP TWQ Science Day Video - Benthic Irradiance as a water quality indicator	*Yes*	14/12/2017	https://youtu.be/WZ87LCG3rcM	

		Journal Article - Fine sediment and particulate organic matter: A review and case study on ridge-to-reef transport, transformations, fates, and impacts on marine ecosystems	*Yes*	01/10/2018	https://www.sciencedirect.com/science/article/pii/S0025326X18305678?via%3Dihub	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/benthic-light-2-3-1	
2.3.2	'Human sensors' for monitoring Great Barrier Reef environmental changes and quality of marine waters through harnessing Big Data analysis	The following outputs will be produced and shared: 1. Research publications: at least 3 journal articles in relevant environmental management journals and at least 2 journal articles in Computer Science journals 2. Popular articles on key findings (e.g. The Conversation and other outlets) 3. Development of an infographic to illustrate the use of micro-blog/social media data for environmental monitoring 4. Meta-data information made available to other researchers in this field. 5. Provision to the data as relevant to e-atlas (TWQ Hub)				
		Project Factsheet - 'Human sensors' for monitoring Great Barrier Reef environmental changes and quality of marine waters through harnessing Big Data analysis	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.2-Factsheet.pdf	
		Conference Paper - Citizen science - exploring tourists' observations on micro bloags as a tool to monitor environmental change	*Yes*	01/08/2016	http://nesptropical.edu.au/wp-content/uploads/2016/08/PaperBeckenStanticGBRBigdataSurrey9.pdf	
		Conference Presentation - Human sensors - monitoring the Great Barrier Reef	*Yes*	30/08/2016	http://nesptropical.edu.au/wp-content/uploads/2016/08/SurreyGBRCitizenScience2.pdf	
		NESP TWQ Science Day Presentation - Big Data Approaches to Reef monitoring	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.3.2-and-3.2.3-Lo.pdf	
		NESP TWQ Science Day Video - Big Data and citizen science	*Yes*	14/12/2017	https://youtu.be/e7dPHrbE_Kw	
		Final Report - The role of social media in sharing information about the Great Barrier Reef	*Yes*	01/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-2.3.2-Final-Report.pdf	
		Journal Article - A Hybrid is born: integrating collective sensing, citizen science and professional monitoring of the environment	*Yes*	01/05/2019	https://www.sciencedirect.com/science/article/abs/pii/S157495411830150X?via%3Dihub	

		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/monitoring-gbr-with-human-sensors-2-3-2	
2.3.3	Building Indigenous livelihood and co-management opportunities in the Northern GBR –ecosystem services and conservation governance for water quality	The major planned outputs of the project are: • a co-authored Interim Summary Report at the end of year 1 • a co-authored Final Report at the completion of the project • 2 draft research journal papers, each led by a different member of the project team and focused on: o the application of ES products and frameworks to the Eastern Cape and Northern GBR, emphasizing watershed services, nutrient offsets, and/or livelihood co-benefits o regional governance and policy implications of the expansion of ES markets across Cape York Peninsula • supporting datasets encompassing: o literature review of ecosystem services watershed products, metrics and monitoring; o the relationship of ES frameworks to contemporary Indigenous livelihoods and to the co-benefits derived from conservation action; and o the applicability of novel water-quality focused ES products for Eastern Cape and				
		Project Factsheet - Building Indigenous livelihood and co-management opportunities in the Northern GBR –ecosystem services and conservation governance for water quality	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.3-Factsheet-Stakeholder.pdf	
		Interim Report - Scoping market-based opportunities for Indigenous provision of water quality services and associated conservation governance in the Northern Great Barrier Reef	*Yes*	12/01/2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.3.3-INTERIM-REPORT-1a.pdf	
		Project Video - Water is our life	*Yes*	n/a	https://vimeo.com/246704119	
		Final Report - Community-based evaluation, governance, and strategic planning for Indigenous Ecosystem Services in Eastern Cape York Peninsula.	*Yes*	01/05/2018	http://nesptropical.edu.au/wp-content/uploads/2018/05/NESP-TWQ-Project-2.3.3-Final-Report-Digital.pdf	
		Journal Article - Identifying and categorizing cobenefits in state-supported Australian indigenous environmental management programs: international research implications	*Yes*	01/05/2018	https://www.ecologyandsociety.org/vol22/iss2/art11/	

		Interim Report - Drivers and Trends in Environmental Markets: Applications for Australia	*Yes*	01/02/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-2.3.3-Interim-Report-2.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/gbr-indigenous-comanagement-wq-2.3.3	
2.3.4	Working with traditional owners and local citizens to better manage GBR estuarine wetlands	All reports from this project will be publically available via the TropWATER, JCU website https://research.jcu.edu.au/tropwater/publications and the NESP TWQ Hub website. Stakeholder engagement workshops will provide an opportunity for public feedback on the project outcomes. Results will be published in peer-reviewed journals. We envisage three publications as a result of this research around the following themes: • Traditional Owner engagement and value in estuarine wetland management • Estuarine wetland monitoring and evaluation toolkit to inform estuarine wetland repair • Post-flood recovery of estuarine wetlands				
		Project Factsheet - Working with traditional owners and local citizens to better manage GBR estuarine wetlands	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.3.4-Factsheet.pdf	
		Progress Report 1 - Southern GBR Coastal Habitat Archive and Monitoring Program	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-2.3.4-PROGRESS-REPORT-1.pdf	
		Journal Article - The Shoreline Video Assessment Method (S-VAM): Using dynamic hyperlapse image acquisition to evaluate shoreline mangrove forest structure, values, degradation and threats	*Yes*	30/08/2016	https://www.sciencedirect.com/science/article/pii/S0025326X16303903	
		Journal Article - Oil spill impacts on mangroves: Recommendations for operational planning and action based on global review	*Yes*	30/08/2016	https://www.sciencedirect.com/science/article/pii/S0025326X16304866	
		Journal Article - The state of legislation and policy protecting Australia's mangrove and salt marsh and their ecosystem services	*Yes*	01/10/2016	https://www.sciencedirect.com/science/article/pii/S0308597X16304067	

		Progress Report 2 - Southern GBR Coastal Habitat Archive and Monitoring Program (S-GBR CHAMP)monitoring report.	*Yes*	28/02/2017	http://nesptropical.edu.au/wp-content/uploads/2017/02/NESP-TWQ-2.3.4-PROGRESS-REPORT-2.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-2/sgbr-estuarine-management-2-3-4	
		Jounral Article - Bruguiera × dungarra, a new hybrid between mangrove species B. exaristata and B. gymnorhiza (Rhizophoraceae) recently discovered in north-east Australia	*Yes*	01/01/2019	https://www.ingentaconnect.com/content/nhn/blumea/2018/00000063/00000003/art00003;jsessionid=248k5mhc57pwm.x-ic-live-02	
		Final Report - Southern Great Barrier Reef Costal Habitat Archive and Monitoring Program: Mangrove Management Plan Volume 1	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-2.3.4-Final-Report-Vol-1.pdf	
2.3.5	eAtlas - Data management for environmental research	• Planned outputs are that datasets from NESP TWQ hub will be published on the eAtlas.				
		Project Factsheet - eAtlas - Data management for environmental research	*Yes*	01/07/2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.5-Factsheet.pdf	

Guidance

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Outputs				
		Outputs (List outputs described in the project plan as well as any additional outputs the project delivered. Insert extra rows as needed)	**Is the output publicly available?**	**Date of publication or expected publication**	**Link to output**	**Comments on outputs** (Comment on any changes to planned output delivery, including changed, additional and non-delivery of outputs. Comments on data exemptions should also be included)
3.1.1	Implementation of the crown of thorns starfish research strategy: regional strategies	• Annual recommendations on priority reefs for control activities. As the DST develops these recommendations will be based on the integration of an increasingly broad range of inputs. • Automated process for developing annual connectivity matrices to underpin DST beyond the life of this project. • Decision support tool to assist in the development and assessment of management objectives and the strategies available to achieve these objectives. This DST is intended to be developed to the point that it can be used and maintained by managers and to operate with data inputs currently being collected in on-going monitoring and management programs. • Reports outlining recommended objectives and strategies identified using the DST. • Report on the prospects for biocontrol and new gene technologies in future control technologies • Report on the distribution and extent of deep reefs in the Cooktown to Townsville region, their use by COTS and the implications of this for the design and				
		Journal Article - Connectivity and systemic resilience of the Great Barrier Reef	*Yes*	28/11/2017	http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2003355	
		NESP TWQ Science Day Presentation - Focusin science to improve Crown-of-Thorns Starfish management	*Yes*	14/12/2017	https://youtu.be/rzP-aAmZaT8	

		Journal Article - Body size and substrate type modulate movement by the western Pacific crown-of-thorns starfish, *Acanthaster solaris*	*Yes*	01/05/2018	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180805	
		Project Factsheet - Implementation of the crown-of-thorns research strategy: regional strategies	*Yes*	01/11/2018	https://nesptropical.edu.au/wp-content/uploads/2018/11/NESP-TWQ-Project-3.1.1-Factsheet.pdf	
		Technical Report - Assessment of deep-water habitat for crown-of-thorns starfish (COTS) in the Great Barrier Reef	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-3.1.1-TECHNICAL-REPORT-1.pdf	
		Journal Article - Incidence and severity of injuries among juvenile crown-of-thorns starfish on Australia's Great Barrier Reef	*Yes*	09/08/2019	https://link.springer.com/article/10.1007/s00338-019-01845-1	
		Journal Article - Managing cross-scale dynamics in marine conservation: Pest irruptions and lessons from culling of crown-of-thorns starfish (*Acanthaster* spp.)	*Yes*	01/10/2019	https://www.sciencedirect.com/science/article/abs/pii/S0006320719304082?via%3Dihub	
		Technical Report - An ecologically-based operational strategy for COTS Control. Integrated decision making from the site to the regional scale	*Yes*	16/04/2020	https://nesptropical.edu.au/wp-content/uploads/2020/04/NESP-TWQ-Project-3.1.1-Technical-Report-2.pdf	
		Technical Report - Movement patterns of Pacific crown-of-thorns starfish (Acanthaster cf. solaris) linked to habitat structure and prey availability	*Yes*	29/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/NESP-TWQ-Project-3.1.1-Technical-Report-3.pdf	
		Journal Article - Relative efficacy of three approaches to mitigate Crown-of-Thorns Starfish outbreaks on Australia's Great Barrier Reef	*Yes*	13/08/2020	https://go.nature.com/2PNyE0q	
		Journal Article - DNA-based identification of predators of the corallivorous Crown-of-Thorns Starfish (Acanthaster cf. solaris) from fish faeces and gut contents	*yes*	18/05/2020	https://go.nature.com/2EtnUSV	
		Media release - Fish faeces reveals which species eat crown-of-thorns	*Yes*	18/05/2020	https://nesptropical.edu.au/wp-cont	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/cots-implementations-strategy	
3.1.2	Improving water quality for the Great Barrier Reef and wetlands by better managing irrigation in the sugarcane farming system	• Productivity data: - will be stored on industry databases. • Farmer management records - water management records will be stored in either WiSA or IrrigWeb or both. • Surveys administered and collected by the project team: - Will be stored on JCU systems. • Press releases by SRA will be stored on SRA systems				

		Conference Presentation - A comparison of data mining algorithms for improving NIR models of cane quality measures. Proceedings of the 39th Annual Conference of the Australian Society of Sugar Cane Technologists	*Yes*	01/06/2017	https://researchonline.jcu.edu.au/48855/		
		Project Factsheet - Improving water quality for the Great Barrier Reef and wetlands by better managing irrigation in the sugarcane farming system	*Yes*	02/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/05/NESP-TWQ-Project-3.1.2-Factsheet.pdf		
		Video - Project 3.1.2 Grower tour, JCU	*Yes*	11/03/2018	https://youtu.be/MhoG1XTF0WY		
		Video - Improving the efficiency of automated sugarcane irrigation in the Burdekin	*Yes*	14/08/2019	https://youtu.be/8ynWvzpBc5I		
		Conference Presentation - A cybernetic precision sugarcane irrigation system informed by the IrrigWeb crop model	*Yes*	07/08/2020	https://nesptropical.edu.au/wp-content/uploads/2020/08/iCROPM-2020.pdf		
		Journal Article - Smarter irrigation scheduling in the sugarcane farming system using the Internet of Things	*Yes*	07/08/2020	https://internationalsugarjournal.com/paper/smarter-irrigation-scheduling-in-the-sugarcane-farming-system-using-the-internet-of-things/		
		Project Flyer - Improving water quality for the Great Barrier Reef and wetlands by better managing irrigation in the sugarcane farming system	*Yes*	07/08/2020	https://nesptropical.edu.au/wp-content/uploads/2020/08/NESP-TWQ-Project-3.1.2-Flyer.pdf		
		Final Report - Improving water quality for the Great Barrier Reef and wetlands by better managing irrigation in the sugarcane farming system	*Yes*	07/08/2020	https://nesptropical.edu.au/wp-content/uploads/2020/08/NESP-TWQ-Project-3.1.2-Final-Report.pdf		
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/iot-irrigation-system-3-1-2		

3.1.3	Harnessing the science of social marketing in communication materials development and behaviour change for improved water quality in the GBR: a desktop review (Project 2.1.3 - Stage 2)	• Planned outputs include: Individual 'factsheets' for each set of material analysed • A final composite factsheet at the end of the analyses, summarising key findings and impacts. • Marketing materials/strategy guidelines and templates, including readability assessment tools and message framing guidelines to support the fine tuning of existing material and the roll out of future communication material. • A final report encompassing the analysis undertaken as part of Project 2.1.3 and the additional analyses proposed in this extension of the project. • Journal articles, seminar presentations and conference papers as appropriate in conjunction with co-investigators.				
		Project Factsheet - Harnessing the science of social marketing in communication materials	*Yes*	03/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.1.3-Factsheet.pdf	
		Final Report - Harnessing the science of social marketing and behaviour change for improved water quality in the Great Barrier Reef: Final report best practice guide for development and modification of program communication material	*Yes*	02/07/2018	https://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.1.3-Final-Report.pdf	

3.1.4	Optimizing the management of riparian zones to improve the health of the Great Barrier Reef	• A report that describes methods and summarizes results on what investments conditions and types were most successful; • Compendium or manual with recommendations to guide future investment in riparian erosion-control remediation works, and estimates of the likely co-benefits for carbon and biodiversity, and; • Communication products as per the projects communication strategy, which may include; (i) presentations and audio-visual materials for focus group discussions with service providers (e.g. Greening Australia) to evaluate their response to proposed measures of revegetation; and (ii) presentations for technical workshops with DEHP and DoEE programme managers to embed results into Government investment planning (e.g. Regional Body groups, Queensland State Government (Policy and modelling groups) and the Reef Trust Unit).				
		Project Factsheet - Optimizing the management of riparian zones to improve the health of the Great Barrier Reef	*Yes*	22/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.1.4-Factsheet.pdf	
		Factsheet - Landholders - Optimising the management of riparian zones to improve the health of the Great Barrier Reef	*Yes*	01/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-3.1.4-Factsheet-Landholders.pdf	
		Factsheet - Policymakers - Optimising the management of riparian zones to improve the health of the Great Barrier Reef	*Yes*	01/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-3.1.4-Factsheet-Policymakers.pdf	
		Final Report - Optimising the management of riparian zones to improve the health of the Great Barrier Reef	*Yes*	01/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-3.1.4-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/riparian-zone-management-3-1-4	

3.1.5	Ecotoxicology of pesticides on the Great Barrier Reef for guideline development and risk assessments	In addition to key roles in the Research and Development and Extension Sub-groups of the Reef Plan PWG we will:- • Provide data (EC10, EC50 and NOEC) and advice from the research directly to key stakeholders for the development of water quality guidelines (National, State, GBRMPA) and risk assessments (APVMA, Department of the Environment and Energy, LTSP, Reef Plan, RWQPP); • Regularly brief key stakeholders at workshops, conferences and meetings and via reports and journal publications; • Present plans and results at GBRMPA Seminar series, through fact sheets and other NESP communication channels, and the eAtlas • Presentation of data and results to key industry support organisations including SRA, Productivity Services and QDAF. • Present at national and international conferences • Scientific papers.				
		Project Factsheet - Ecotoxicology of pesticides on the Great Barrier Reef for guideline development and risk assessments	*Yes*	01/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.1.5-Factsheet.pdf	
		Journal Article - Contribution of transformation products towards the total herbicide toxicity to tropical marine organisms	*Yes*	01/06/2019	https://go.nature.com/2WThl40	
		Journal Article - Detecting effects of herbicide runoff: The use of Cassiopea maremententens as a biomonitor to hexazinone	*Yes*	17/03/2020	https://www.sciencedirect.com/science/article/abs/pii/S0166445X19308318?via%3Dihub	
		Final Report - Ecotoxicology of pesticides on the Great Barrier Reef for guideline development and risk assessments	*Yes*	14/04/2020	https://nesptropical.edu.au/wp-content/uploads/2020/04/NESP-TWQ-Project-3.1.5-Final-Report.pdf	
		Journal Article - Adjusting Tropical Marine Water Quality Guideline Values for Elevated Ocean Temperatures	*Yes*	05/05/2020	https://pubs.acs.org/doi/10.1021/acs.est.9b05961	
		Journal Article - Toxicity of ten herbicides to the tropical marine microalgae Rhodomonas salina	*Yes*	15/06/2020	https://go.nature.com/2AC2kth	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/pesticide-guidelines-gbr-3-1-5	

3.1.6	Exploring trading in water quality credits as a cost-effective approach for managing water quality in the Great Barrier Reef	For Stakeholders: • Plain-English summary of what would / would not be likely to work in potential credit trading schemes for managing nitrogen and sediment. • Plain-English summary of key features of potential trading frameworks for water quality credits in Reef catchments. • Plain-English summary of potential innovative business opportunities around nitrogen and sediment mitigation in the Reef catchments • Presentations of research findings and project outputs at key locations (e.g. Wet Tropics, Dry Tropics, Brisbane and Canberra), webinar enabled • Summary content, video and slideshow for the NESP TWQ webpage For academia: • At least two peer-reviewed papers detailing research findings				
		Project Factsheet - Exploring trading in water quality credits as a cost-effective approach for managing water quality in the Great Barrier Reef	*Yes*	01/06/2017	https://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.1.6-Factsheet.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/exploring-wq-trading-3-1-6	
3.1.7	Reducing sediment loads to the Great Barrier Reef: developing optimal approaches for treating alluvial gully erosion	• Project outputs will be published on several websites, including http://www.capeyorkwaterquality.info/, CYNRM, BDT, DSITI, Greening Australia and the NESP TWQ Hub website. • Dedicated policy briefing event • Peer-reviewed publications • Key findings 'brochure' prepared, targeted at the generalist reader • Presentation of results at relevant conferences • Communication of key findings in media releases (coordinated with the NESP)				
		Project Factsheet - Reducing sediment loads to the Great Barrier Reef: developing optimal approaches for treating alluvial gully erosion	*Yes*	22/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.1.7-Factsheet.pdf	
		NESP TWQ Science Day Presentation - Alluvial Gully Rehabilitation: where are we up to?	*Yes*	14/12/2017	http://nesptropical.edu.au/index.php/round-3-projects/project-3-1-7/	

		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/treating-gully-erosion-3-1-7	
3.1.8	Innovative economic levers: a system for underwriting risk of practice change in cane-farming	• Project outputs will be published on the NESP TWQ Hub website. • Dedicated policy briefing event • Peer-reviewed publications • Project brochure prepared, targeted at farmers/industry • Presentation of results at relevant conferences • Communication of key findings in public releases (coordinated with the NESP)				
		Project Factsheet - Innovative economic levers: a system for underwriting risk of practice change in cane-farming	*Yes*	01/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.1.8-Factsheet.pdf	
		Conference Presentation - Producing APSIM soil parameters from soil survery data to underping better nitrogen management	*Yes*	01/06/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/253-P9-Barboux-et-al.pdf	
		Conference Presentation - Nitrogen and sugarcane: Changing the conversation to risk of yield loss if fertiliser rates are reduced	*Yes*	01/06/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/255-P11-Thorburn-et-al.pdf	
		Final Report - Innovative economic levers: a system for underwriting risk of practice change in cane-farming	*Yes*	30/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/NESP-TWQ-Project-3.1.8-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/nitrogen-yield-loss-insurance-3-1-8	

3.2.1	Deriving ecologically relevant load targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	Written outputs: • Plain English summaries of project progress as emails and fact sheets for end-users, including TOs • Manuscripts submitted to peer-reviewed journals • Final report including: o A protocol for establishing seagrass desired state o Desired state for the Burdekin region o ERTs for light and sediment loads in the Burdekin region o Benthic light and Kd at multiple seagrass sites in Cleveland Bay over multiple time periods General outputs: • Presentations that will be delivered to end-users, NESP TWQ annual conferences and at national conferences where appropriate • Press releases, social media postings (tweets, Facebook and website updates) and summary plain English information sheets coinciding with each report/paper release in accordance with NESP media protocols.				
		Project Factsheet - Deriving ecologically relevant load targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	*Yes*	03/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.2.1-Factsheet.pdf	
		NESP TWQ Science Day Presentation - Light, turbidity, seagrass and water quality targets	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-3.2.1-Lo.pdf	
		Book Chapter - Seagrass Resistance to Light Deprivation: Implications for Resilience	*Yes*	01/08/2018	https://link.springer.com/chapter/10.1007%2F978-3-319-71354-0_10	
		Seminar Flyer - Condition and trend of seagrasses of the Great Barrier Reef and setting ecologically relevant sediment load targets	*Yes*	01/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/01/NESP-TWQ-Project-3.2.1-Seminar-Flyer.pdf	
		Technical Report - A framework for defining seagrass habitat for the Great Barrier Reef	*Yes*	01/02/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-3.2.1-TECHNICAL-REPORT-1.pdf	

		Journal Article - An evidence-based approach for setting desired state in a complex Great Barrier Reef seagrass ecosystem: A case study from Cleveland Bay	*Yes*	14/07/2020	https://www.sciencedirect.com/science/article/pii/S2665972720300246?via%3Dihub	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/eco-load-targets-seagrass-3-2-1	
3.2.2	The IMS 2050 Human Dimensions Project: cost-effective indicators and metrics for key GBRWHA human dimensions	• This project will identify multiple data sets and lines of evidence of value in developing robust indices and indicators associated with benchmarking and monitoring change with respect to the human dimension and Indigenous indicators associated with management of the GBR and implementation of the Reef 2050 Plan. • A preliminary benchmark report (human dimensions) and the separately reported integrated framework for Indigenous indicator testing and benchmarking will be key synthesis products.				
		Project Factsheet - The IMS 2050 Human Dimensions Project: cost-effective indicators and metrics for key GBRWHA human dimensions	*Yes*	01/06/2017	https://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.2.2-FactsheetA.pdf	
		NESP TWQ Science Day Presentation - Light, turbidity, seagrass and water quality targets	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-3.2.2-Lo.pdf	
		NESP Science Day Video - Assessment and monitoring of human dimensions in reef management	*Yes*	14/12/2017	https://youtu.be/X1Gqg81VkM8	
		Journal Article - Assessment and Promotion of the Great Barrier Reef's Human Dimensions Through Collaboration	*Yes*	03/11/2017	http://dx.doi.org/10.1080/08920753.2017.1373455	
		Final Synthesis Report - Trialling an Assessment and Monitoring Program for the Human Dimensions of the Reef 2050 Integrated Monitoring and Reporting Program	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Synthesis-Report.pdf	
		Final Report - Assessing the human dimensions of the Great Barrier Reef: A Burdekin Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Burdekin.pdf	
		Final Report - Assessing the human dimensions of the Great Barrier Reef: A Burnett-Mary Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Burnett-Mary.pdf	

		Final report - Assessing the human dimensions of the Great Barrier Reef: An Eastern Cape York Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Eastern-Cape-York.pdf	
		Final Report - Assessing the human dimensions of the Great Barrier Reef: A Fitzroy Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Fitzroy.pdf	
		Final Report - Assessing the human dimensions of the Great Barrier Reef: A Mackay-Whitsunday Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Mackay-Whitsunday.pdf	
		Final Report - Assessing the human dimensions of the Great Barrier Reef: A Wet Tropics Region focus	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.2-Final-Report-Wet-Tropics.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/human-dimension-indicators-3-2-2	
3.2.3	Monitoring aesthetic value of the Great Barrier Reef by using artificial intelligence to score photos and videos	Stakeholder-focused outputs: • A report on the results from the eye tracking and biophysical measurement experiments to determine key dimensions and attributes of aesthetic value, differentiated by cultural or consumer segment, as appropriate. • An IT proof of concept and architecture with algorithms that can be extended to monitor expert material (e.g. through underwater cameras). • A workshop targeted at Indigenous groups who wish to become more involved in ecotourism opportunities (planned towards the end of the project, e.g. around November 2017). Academic outputs: • Popular articles on key findings (e.g. The Conversation) • At least two articles. • Meta-data information made available to other researchers in this field. • Provision of the data as relevant to e-atlas (TWQ Hub) (see below).				
		Project Factsheet - Monitoring aesthetic value of the Great Barrier Reef by using artificial intelligence to score photos and videos	*Yes*	02/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.2.3-Factsheet.pdf	

		NESP TWQ Science Day Presentation - Big Data approaches to Reef monitoring	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-2.3.2-and-3.2.3-Lo.pdf	
		NESP Science Day Video - Big Data and citizen science	*Yes*	14/12/2017	https://youtu.be/e7dPHrbE_Kw	
		Final Report - Monitoring aesthetic value of the Great Barrier Reef by using innovative technologies and artificial intelligence	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/NESP-TWQ-Project-3.2.3-Final-Report.pdf	
		Infographic - Environmental Monitoring using Social Media	*Yes*	01/07/2018	http://nesptropical.edu.au/wp-content/uploads/2018/07/082_17-ENVIRONMENTAL-MONITORING-INFOGRAPHIC_C16_NO-BLEED.pdf	
		Conference Presentation - Using social media photographs to monitor changes in aesthetic value at tourist destinations	*Yes*	01/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/AestheticvaluemonitoringBecken_UNWTO_ConferenceJune2018.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/aesthetic-value-gbr-3-2-3	
3.2.4	Defining, assessing and monitoring Great Barrier Reef aesthetics	• List of factors that contribute to Reef aesthetics that can be used in legal policies and processes and can meet UNESCO reporting requirement. These factors will be accompanied by a list of recommendations about how they can be measured and monitored • Science papers around: o Reef Aesthetics, and its relationship with Wellbeing in the region o The relationship between Reef health and Reef aesthetics o Is the beauty of coral reefs in the eye of the beholder? • Milestone reports as indicated above • Final technical report	*Yes*			
		Project Factsheet - Defining, assessing and monitoring Great Barrier Reef aesthetics	*Yes*	22/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.2.4-FactsheetA.pdf	
		Video - NESP Aesthetics Workshop	*Yes*	20/03/2018	https://www.youtube.com/watch?	
		Final Report - Managing for aesthetic values in the Great Barrier Reef: Identifying indicators and linking reef aesthetics to reef health	*Yes*	01/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-3.2.4-Final-Report.pdf	
		Journal Article - Identifying indicators of aesthetics in the Great Barrier Reef for the purposes of management	*Yes*	01/02/2019	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210196	

		Media Release - Evaluating the beauty of the Great Barrier Reef	*Yes*	01/03/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/Media-Release-Aesthetics-Paper-PLOS-ONE-FINAL-21Feb19.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/defining-assessing-monitoring-gbr-aesthetics-3-2-4	
3.2.5	Testing and implementation of the water quality metric for the 2017 and 2018 reef report cards	• A revised marine water quality metric for Reef Report Card which addresses limitations of the existing metric in terms of sensitivity and response to changes; • A biogeochemical model assimilating remote sensing reflectance; • A collection, processing and integration process for marine water quality data collected in situ, via remote sensing and produced by the eReefs biogeochemical model; • Presentations to key stakeholders within the Reef 2050 Plan including RIMReP and Reef Water Quality Protection Plan • Scientific technical report on the outcomes of this research and recommendations on options for operational implementation				
		Project Factsheet - Testing and implementation of the water quality metric for the 2017 and 2018 reef report cards	*Yes*	22/06/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.2.5-Factsheet.pdf	
		NESP TWQ Science Day Presentation - Improvements to the marine water quality metric for Reef Report Card	*Yes*	01/04/2018	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-3.2.5-Lo.pdf	
		Final Report - Testing and implementation of an improved water quality index for the 2016 and 2017 Great Barrier Reef Report Cards	*Yes*	01/08/2018	https://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-3.2.5-Final-Report.pdf	
		Summary Report - Testing and implementation of an improved water quality index for the 2016 and 2017 Great Barrier Reef Report Cards. Summary Report	*Yes*	01/08/2018	https://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-3.2.5-Summary-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/wq-metric-report-cards-3-2-5	

3.3.1	Quantifying the linkages between water quality and the thermal tolerance of GBR coral reefs	• WQ modulated bleaching thresholds for key coral species that can be used for bleaching forecast monitoring • Scientific reports and publication of new numerical models of the processes of coral bleaching in leading journals. • Scientific reports and publication of the environmental drivers of variation in bleaching sensitivity and recovery on the GBR. • Final technical report				
		Project Factsheet - Quantifying the linkages between water quality and the thermal tolerance of GBR coral reefs	*Yes*	03/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.3.1-Factsheet.pdf	
		NESP Science Day Presentation - Bleaching and Water Quality - What is the connection?	*Yes*	14/12/2017	http://nesptropical.edu.au/wp-content/uploads/2017/12/Project-3.3.1-Lo.pdf	
		Summary Report - Testing and implementation of an improved water quality index for the 2016 and 2017 Great Barrier Reef Report Cards. Summary Report	*Yes*	06/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-3.2.5-Summary-Report.pdf	
		Final Report - Testing and implementation of an improved water quality index for the 2016 and 2017 Great Barrier Reef Report Cards	*Yes*	06/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-3.2.5-Final-Report.pdf	
		Journal Article - Nutrient Availability and Metabolism Affect the Stability of Coral–Symbiodiniaceae Symbioses	*Yes*	14/05/2019	https://www.cell.com/trends/microbiology/fulltext/S0966-842X(19)30068-X?_returnURL=https://linkinghub.elsevier.com/retrieve/pii/S0966842X1930068X%3Fshowall%3Dtrue	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/coral-wq-thermal-tolerance-3-3-1	

3.3.2	Science evaluation of coastal wetland systems repair projects across GBR catchments	• GIS mapping that captures completed, current and planned wetland system repair projects in the GBR catchment area; • Meta-analysis of available wetland system repair projects collated from the study area for storage in Wetlands Info website and E-atlas; • Access to scientific data collected by the project; • Report detailing the constraints and opportunities to improve coastal wetland restoration and repair for the nominated project sites; and • Scientific publications and presentations at community events. These outputs will include a communication closure plan, to inform end users specifically of the outcomes and success of the project. All end users will be included in this communication, including Indigenous groups involved in the project.				
		Project Factsheet - Science evaluation of coastal wetland systems repair projects across GBR catchments	*Yes*	03/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/08/NESP-TWQ-Project-3.3.2-Factsheet.pdf	
		E-newsletter article - View on TWQ October 2017	*Yes*	01/10/2017	http://nesptropical.edu.au/index.php/news-events/e-newsletters-2/october-2017/electrifying-methods-of-evaluating-wetland-rehabilitation/	
		E-newsletter article - View on TWQ February 2018	*Yes*	20/02/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/february-2018/	
		Poster - Science evaluation of coastal wetland repair systems projects across GBR catchments	*Yes*	17/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-3.3.2-Poster-Upload.pdf	
		Media Release - Pigs shut out of critical Queensland wetlands	*yes*	06/09/2018	http://nesptropical.edu.au/wp-content/uploads/2018/09/JCU-Media-Feral-pig-fence.pdf	
		NQDT Factsheet - Update on Horseshoe and lilliesmere lagoons	*Yes*	29/10/2018	https://nesptropical.edu.au/wp-content/uploads/2018/10/EHPS16-Wetland-Evaluation-update-publication-Final-August-2018.pdf	
		News Article (Burdekin Advocate) - Research into wetlands spelt out by scientists	*Yes*	08/01/2019	https://nesptropical.edu.au/wp-content/uploads/2019/05/Burdekin-Post-30-April-2019-_Research-into-wetlands-spelt-out-by-scientists-NESP.pdf	

		Journal Article - Managing threats and restoring wetlands within catchments of the Great Barrier Reef, Australia	*Yes*	07/05/2019	https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.3096	
		Journal Article - Lost Floodplain Wetland Environments and Efforts to Restore Connectivity, Habitat, and Water Quality Settings on the Great Barrier Reef	*Yes*	07/05/2019	https://www.frontiersin.org/articles/10.3389/fmars.2019.00071/full	
		Journal Article - UN Decade on Ecosystem restoration 2021-2030 - What chance for success in restoring coastal ecosystems?	*Yes*	01/03/2020	https://www.frontiersin.org/articles/10.3389/fmars.2020.00071/full	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/wetlands-repair-evaluation-3-3-2	
3.3.3	Defining the values of the ecological systems that influence the GBR and lie outside the marine park and world heritage area boundaries	The main project outputs include: • a synthesis of the ecological connectivity between the GBR and Coral Sea, • a synthesis of the physical drivers of ecological connectivity between the GBR and Coral Sea, • a description of important values in the systems adjacent to the GBRWHA, • an analysis of overlaps and synergies in values between systems, and • spatial characterisation of values and the connections and interdependencies across systems for the key values. • if the project identifies additional Biological Important Areas (BIA), the new/updated BIA will be provided to eAtlas for inclusion on the ERIN Conservation Values Atlas. These outputs will form the basis of a non-technical project report that delivers information that can underpin strategies, plans and programs to improve protection and management of important values, and improve coordination and efficiencies across management jurisdictions. In addition, the project will deliver informal progress reports to key				
		Project Factsheet - Defining the values of the ecological systems that influence the GBR and lie outside the marine park and world heritage area boundaries	*Yes*	01/08/2017	http://nesptropical.edu.au/wp-content/uploads/2017/06/NESP-TWQ-Project-3.3.3-Factsheet.pdf	
		E-newsletter article: View on TWQ May 2018	*Yes*	15/05/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/may-2018/	

		Final Report - Characterising the values and connectivity of the northeast Australia seascape: Great Barrier Reef, Torres Strait, Coral Sea and Great Sandy Strait. Technical Report (Part 1)	*Yes*	18/10/2018	https://nesptropical.edu.au/wp-content/uploads/2018/10/NESP-TWQ-Project-3.3.3-Final-Report-Part-1.pdf	
		Final Report - Supplementary Synthesis Report: Connectivity and inter-dependencies of values in the northeast Australia seascape. Supplementary Report (Part 2)	*Yes*	18/10/2018	https://nesptropical.edu.au/wp-content/uploads/2018/10/NESP-TWQ-Project-3.3.3-Final-Report-Part-2.pdf	
		Final Summary Report - Characterising the values and connectivity of the northeast Australia seascape: Great Barrier Reef, Torres Strait, Coral Sea and Great Sandy Strait. Summary for Decision-Makers	*Yes*	18/10/2018	https://nesptropical.edu.au/wp-content/uploads/2018/10/NESP-TWQ-Project-3.3.3-Summary-Report-V3.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-3/ecological-values-3-3-3	

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Outputs				
		Outputs (List outputs described in the project plan as well as any additional outputs the project delivered. Insert extra rows as needed)	**Is the output publicly available?**	**Date of publication or expected publication**	**Link to output**	**Comments on outputs** (Comment on any changes to planned output delivery, including changed, additional and non-delivery of outputs. Comments on data exemptions should also be included)
4.1	Crown-of thorns starfish: surveillance and life history	Parameterization of models currently guiding management decisions, decision tree and guidance on future control technologies, design and development of surveillance methods.				
		Media Release - DNA detection helps defend Great Barrier Reef from coral-eating starfish	*Yes*	22/01/2018	https://nesptropical.edu.au/wp-content/uploads/2018/03/DNA-technology-helps-defend-Great-Barrier-Reef-from-coral-eating-starfish.pdf	
		Project Factsheet - Crown-of thorns starfish: surveillance and life history	*Yes*	22/02/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-4.1-Factsheet.pdf	
		Journal Article - Biogeographical variation in diurnal behaviour of Acanthaster planci versus Acanthanster cf. solaris	*Yes*	18/03/2020	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0228796	
		Journal Article - Habitat associations of settlement-state crown-of-thorns starfish on Australia's Great Barrier Reef	*Yes*	26/06/2020	https://link.springer.com/article/10.1007/s00338-020-01950-6	
		Technical Report - How effective are management responses in controlling crown-of-thorns starfish and their impacts on the Great Barrier Reef?	*Yes*	16/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/CSIRO-COTS-Control-Effectiveness-Report.pdf	
		Journal Article - DNA-based identification of predators of the corallivorous Crown-of-Thorns Starfish (Acanthaster cf. solaris) from fish faeces and gut contents	*yes*	18/05/2020	https://go.nature.com/2EtnUSV	
		Media release - Fish faeces reveals which species eat crown-of-thorns	*Yes*	18/05/2020	https://nesptropical.edu.au/wp-content/uploads/2020/09/crown-of-thorns-press-release.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/cots-surveillance-4-1	

4.2	Oceanographic drivers of bleaching in the GBR: from observations to prediction	An accessible environmental dataset to be used to validate models and assist bleaching response. Introduce 3D eReefs versions of SST bleaching products to give a vertical component rather than just the sea surface from satellites A review and analysis of forecast and NRT products Seasonal forecast MHW and NRT Bleaching products Review of past thermal events Thermal stress and mixing hazard map identifying regions and reefs persistently at risk of thermal stress or not and the reasons why to assist in identifying the likelihood of repeat bleaching Assist the selection process for regions and reefs suitable for active management intervention Comprehensive environmental observational dataset and maps of past events to feed into projects 4.4 and 4.5. A tile specific to the Torres Strait will be made from the outputs described above				
		Project Factsheet - Oceanographic drivers of bleaching in the GBR: from observations to prediction	*Yes*	14/06/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/NESP-TWQ-Project-4.2-Factsheet.pdf	
		Outcomes Factsheet - Oceanographic drivers of bleaching in the GBR: from observations to prediction	*Yes*	05/05/2020	https://nesptropical.edu.au/wp-content/uploads/2020/05/NESP-TWQ-Project-4.2-Factsheet-Bleaching.pdf	

4.3	Best practice coral restoration for the Great Barrier Reef	•Critical scientifically tested information for the development of best-practice guidelines and management strategies. •Photos and video assets to be used to communicate coral restoration opportunities. •Guidelines for best practice coral restoration in the GBR. These may include restoration options that are not appropriate for ecological recovery of coral reefs but do enhance local tourism experiences. •Opportunities for Traditional Owner involvement including employment opportunities •Re-establish local populations of reef corals on damaged reefs areas. •Best practice guidelines for coral restoration in the Great Barrier Reef. •Video 'Coral restoration opportunities in				
		Project factsheet - Best practice coral restoration for the Great Barrier Reef	*Yes*	01/06/2018	https://nesptropical.edu.au/wp-content/uploads/2018/06/NESP-TWQ-Project-4.3-Factsheet.pdf	
		Signage at Agincourt Reef Pontoon: Reef Restoration Project	*Yes*	06/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/AG3-Reef-Restoration-1200x600-lr.pdf	
		Baseline Report - Fitzroy Island Coral Nursery Installation and Baseline Report	*Yes*	09/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-4.3-BASELINE-REPORT-1.pdf	
		Technical Report - Coral restoration in a changing world: A global synthesis of methods and techniques	*Yes*	01/02/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-4.3-Technical-Report-1.pdf	
		Journal Article - Rehabilitation of coral reefs through removal of macroalgae: state of knowledge and considerations for management and implementation.	*Yes*	16/04/2019	https://onlinelibrary.wiley.com/doi/abs/10.1111/rec.12852	
		Flyer - Reef Leadership and Restoration Workshop	*yes*	28/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-4.3-OIRS-Flyer.pdf	
		Technical Report - Why do Great Barrier Reef tourism operators engage in coral restoration? An exploration of motivations, opportunities, and challenges	*Yes*	26/06/2020	https://nesptropical.edu.au/wp-content/uploads/2020/06/NESP-TWQ-Project-4.3-Technical-Report-2.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/drivers-of-bleaching-4-2	

4.4	The traits of corals that survived recent bleaching events	•Estimates of pre and post bleaching genetic diversity of key coral species •Estimates of environmental drivers of the abundance of coral associated and free living reservoirs of temperature tolerant symbionts •Identification of key populations at risk as well as populations with high potential for use as breeding stock for Assisted Gene Flow Estimates on the impact of bleaching on A. hyacinthus genetic diversity •Reports and briefings to incorporate estimates of importance, abundance, and impact of bleaching on key free living reservoirs of temperature tolerant symbionts •Reports and briefings of key populations of Acropora at risk of loses in genetic diversity •A scoping document developed in collaboration with GBRMPA staff (Bronwyn Houlden and others) on how to best operationalize the research findings of this project into management actions. This may include the linked NESP functional reefs project (4.6) led by Prof Mumby on species that underpin reef function or through a				
		Project Factsheet: The traits of corals that survived recent bleaching events	*Yes*	21/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-4.4-Factsheet.pdf	
		Media Release - Which coral survive mass bleaching events?	*Yes*	19/12/2018	https://nesptropical.edu.au/index.php/2018/12/19/which-corals-survive-mass-bleaching-events/	
		Journal Article - Population genetics of the coral Acropora millepora: Toward genomic prediction of bleaching	*Yes*	23/07/2020	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-4.4-Factsheet.pdf	
		Media Release - Genome research brings identification of heat-resilient corals a step closer	*Yes*	23/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/MR-AIMS-genomic-predictor-research_17July2020.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/survive-bleaching-4-4	

4.5	Guidance system for resilience-based management of the Great Barrier Reef	RBM guidance software. Agreed though specific format will be developed jointly with users. Recommendations for prioritising action (excel files of coordinates, reef IDs). Online maps of reef state (Google Earth) as open access. Contributions to the CoTS IPM being developed under NESP2, 3 & 4.				
		Project Factsheet - Guidance system for resilience-based management of the Great Barrier Reef	*Yes*	21/06/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/NESP-TWQ-Project-4.5-Factsheet.pdf	
		Baseline Report - Identification of Important Source Reefs for Great Barrier Reef Recovery following the 2016-17 Thermal Stress Events	*Yes*	02/08/2018	http://nesptropical.edu.au/wp-content/uploads/2018/08/NESP-TWQ-Project-4.5-Baseline-Report-1.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/guidance-system-4-5	
4.6	Recommendations to maintaining functioning of the Great Barrier Reef	Reports recommending species management plans. Agreed – desired and conversation already started for plate corals Workshop discussions with end users to inform recommendations				
		Project Factsheet - Recommendations to maintaining functioning of the Great Barrier Reef	*Yes*	21/06/2018	http://nesptropical.edu.au/wp-content/uploads/2018/06/NESP-TWQ-Project-4.6-Factsheet.pdf	
		Presentation - Recommendations to maintain functioning of GBR.	*Yes*	16/04/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/AIMS-NESP4.6-2019.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/functioning-gbr-4-6	

4.7	Indigenous coral reef tourism	•The research report and recommendations will be delivered through the final report and through direct presentations to the Department and to the NESP Steering Committee. •The report will be focused on ways and means to deliver on the Reef 2050 Indigenous Implementation Plan, specifically in relation to Actions EBA1 and EBA2 and related targets focussing on TO economic participation in Reef tourism industries. •It will also address how the outcomes of the research connect to the work of the other NESP Hubs, particularly the Marine Biodiversity, Northern Australia Environmental Resources and Threatened Species Recovery hubs. •Practice change – better inclusion of TO knowledge in GBR tourism, disseminated through TO groups. •Achieve the Reef 2050 Indigenous Implementation Plan Targets EBT1 of increasing the number of TO service providers and viable businesses; and EBT2 increasing the number of employment opportunities for TOs in sea country				
		E-newsletter article: View on TWQ May 2018	*Yes*	15/05/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/may-2018/	
		Project Factsheet - Indigenous Coral Reef Tourism	*Yes*	29/10/2018	https://nesptropical.edu.au/wp-content/uploads/2018/10/NESP-TWQ-Project-4.7-Factsheet.pdf	
		Final Report - Great Barrier Reef Indigenous Tourism- Translating Policy Into Practice	*Yes*	01/05/2020	https://nesptropical.edu.au/wp-content/uploads/2020/05/NESP-TWQ-Project-4.7-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/indigenous-tourism-4-7	
4.8	Project 25' Farmers, water quality and on-farm decision-making	Management guidelines for similar program roll-outs and design Specific sub-catchment data on water quality 'hotspots'.				
		Project 4.8 - ' Project 25' - farmers, water quality and on-farm decision-making	*Yes*	06/11/2018	https://nesptropical.edu.au/wp-content/uploads/2018/11/NESP-TWQ-Project-4.8-Factsheet.pdf	
		Final Report - Great Barrier Reef Indigenous Tourism. Translating Policy Into Practice	*Yes*	21/05/2020	https://nesptropical.edu.au/wp-content/uploads/2020/05/NESP-TWQ-Project-4.7-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/on-farm-decision-making-4-8	

4.9	Gully characterisation framework to underpin GBR catchment water quality management	Produce a web-based database of Qld gullies Produce a report for wide circulation (subject to further funding from a publisher) – produce a hard copy field guide to Qld Gullies				
		Project Factsheet - Gully characterisation framework to underpin GBR catchment water quality management	*Yes*	18/04/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-4.9-Factsheet.pdf	
		Final Report - A Gully Classification Scheme to Underpin Great Barrier Reef Water Quality Management	*Yes*	30/11/2019	https://nesptropical.edu.au/wp-content/uploads/2019/11/NESP-TWQ-Project-4.9-Final-Reporta.pdf	
		Project Presentation - 2019 international gully symposium	*Yes*	07/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/Presm_Presentation_Thwaites.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/gully-characterisation-4-9	
4.10	Evaluating the Costs and Benefits of Agricultural Land Conversion to Wetlands	Data generated during this project will inform Greening Australia project site forward planning, for example, mapping constructed wetlands and drainage works that could be restored, and the ability to estimate economic costings for maintenance will be of direct benefit to Greening Australia, positioning them to further attract private funding investment, in addition to the part funding provided from Reef Trust Data and costing relationships produced				
		E-newsletter article: View on TWQ October 2018	*Yes*	05/10/2018	https://nesptropical.edu.au/index.php/news-events/e-newsletters-2/october-2018/	
		Project Factsheet- Evaluating the Costs and Benefits of Agricultural Land Conversion to Wetlands	*Yes*	22/02/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-4.10-Factsheet.pdf	
		Video - Finding the value of constructed wetlands in Great Barrier Reef catchments	*Yes*	07/08/2019	https://youtu.be/J1FBFZ59ib8	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/agri-land-conversion-4-10	
4.11	Sources, transformations and fate of particulate and dissolved organic carbon – implications for the GBR	Literature review, conceptual model and data analysis with a focus on implications for GBR and the monitoring program. Factsheets and final technical report				
		Project Factsheet - Source, transformations and fate of dissolved organic carbon - implications for the GBR	*Yes*	21/09/2018	https://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-4.11-Factsheet.pdf	

		Final Report - Sources, transformations and fate of particulate and dissolved organic carbon: Implications for the Great Barrier Reef has been submitted and distributed to key end users. An agreed embargo period will see the report uploaded to the project webpage on 1 September 2019.	*Yes*	01/09/2019	https://nesptropical.edu.au/wp-content/uploads/2019/09/NESP-TWQ-Project-4.11-Final-Report.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/din-implications-4-11	
4.12	Measuring cost-effectiveness and identifying key barriers and enablers of lasting behavioural change in the cane industry	Literature review, conceptual model and data analysis with a focus on implications for GBR and the monitoring program. Factsheets and final technical report •Final technical report				
		Project Factsheet - Measuring cost-effectiveness and identifying key barriers and enablers of lasting practice change in the cane industry	*Yes*	06/09/2018	http://nesptropical.edu.au/wp-content/uploads/2018/09/NESP-TWQ-Project-4.12-Factsheet.pdf	
		News Article (Daily Mercury) - Farmers to protect water	*Yes*	31/05/2019	https://nesptropical.edu.au/wp-content/uploads/2019/05/DailyMercury_News-article.pdf	
		Workshop Summary - Creating collective decisions	*Yes*	31/05/2019	https://nesptropical.edu.au/wp-content/uploads/2019/05/CCS_Summary-report_08052019_condensed.pdf	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/behavioural-change-4-12	

4.13	Assessing the Gulf of Carpentaria mangrove dieback	Identification of factors relating to the implementation location, implementing farm business and implementing landowner that influence the cost-effectiveness of the program in terms of reducing nitrogen loads to the Reef lagoon. Where data permit, cost-effectiveness assessment will encompass key risks/assumptions e.g. risk of reversion to old practices and potential impacts from external drivers such as cane and fertiliser prices, and information from sources other than government extension. Practice change – landowners and project stakeholders. Social survey reports for the suite of programs evaluated. IMA assessments for the suite of programs. Cost-effectiveness assessments for the suite of programs. A set of recommendations for identifying cost effective programs that deliver lasting practice change. Subject to approval, research outcomes include journal publications, conference presentations and one or more student				
		Project Factsheet - Assessing the Gulf of Carpentaria mangrove dieback	*Yes*	18/04/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-4.13-Factsheet.pdf	
		Journal Article - Biological responses to the press and pulse of climate trends and extreme events	*Yes*	21/01/2020	https://go.nature.com/36iMXjy	
		NAER Factsheet 1 - Assessing mangrove dieback in the Gulf, Start Up	*Yes*	21/01/2020	https://nesptropical.edu.au/wp-content/uploads/2020/01/Mangrove-dieback-start-up-factsheet_NAER.pdf	
		NAER Factsheet 2 - Assessing mangrove dieback in the Gulf of Carpentaria, Update	*Yes*	21/02/2020	https://nesptropical.edu.au/wp-content/uploads/2020/01/Mangrove-dieback-update-June-2019-1_NAER.pdf	
		Field Guide - Indigenous Ranger field guide to the Shoreline Video Assessment Method	*Yes*	10/06/2020	https://nesptropical.edu.au/wp-content/uploads/2020/06/Indigenous-Ranger-field-guide-to-the-Shoreline-Video-Assessment-Method.pdf	

		Journal Article - Mangrove harbingers of coastal degradation seen in their responses to global climate change coupled with ever-increasing human pressures	*Yes*	26/06/2020	https://link.springer.com/article/10.1007/s00338-020-01950-6	
		eAtlas project page	*Yes*	n/a	https://eatlas.org.au/nesp-twq-4/mangrove-dieback-4-13	

Tropical Water Quality Hub 2020 Interim Report - Attachment A

Project Number/ID	Project Name/Title	Outputs				
		Outputs (List outputs described in the project plan as well as any additional outputs the project delivered. Insert extra rows as needed)	**Is the output publicly available?**	**Date of publication or expected publication**	**Link to output**	**Comments on outputs** (Comment on any changes to planned output delivery, including changed, additional and non-delivery of outputs. Comments on data exemptions should also be included)
5.1	Matching the CoTS IPM to the scale of the new control program	Computer programs and apps to guide decision making at site, reef, region and GBR scales Decision trees to guide the design of the expanded program Reports outlining a blueprint for the design of long-term management program and future research needs.				
		Project Factsheet - Matching the CoTS IPM to the scale of the new control program	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/02/NESP-TWQ-Project-5.1-Factsheet.pdf	
		Technical Report - Social and Economic Outcomes of the COTS Control Youth Training Program	*Yes*	14/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/NESP-TWQ-Project-5.1-Technical-Report-1.pdf	
5.2	From exposure to risk: novel experimental approaches to analyze cumulative impacts and determine thresholds in the GBRWHA	Research in peer-reviewed international journals and at stakeholder-focussed workshops An interactive on-line tool using the eAtlas platform and derived exposure maps that reflects the key model results and focuses on exploring the consequences of alternate management interventions.				
		Project Factsheet - From exposure to risk: novel experimental approaches to analyze cumulative impacts and determine thresholds in the GBRWHA	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.2-Factsheet.pdf	Final report is in external peer review

5.3	Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	bPAR maps WQI maps Plain English fact sheets summarising the results of SeaSIM experiments and analysis of benthic community monitoring data Plain English fact sheet summarising the results and implications of the "drivers of variability and management levers" paper Peer reviewed papers describing bPAR as a WQI and the drivers of temporal and spatial variability in bPAR. bPAR maps for the Fitzroy region in netCDF or web formats. Plain English fact sheet summarising the results and implications of the "drivers of variability and management levers" paper. Peer reviewed papers describing SeaSIM results. Graphical and statistical analyses of modelled bPAR evaluation. bPAR and WQI data in netCDF format				
		Project Factsheet - Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.3-Factsheet.pdf	
		Journal Article - Contrasting responses of the coral Acropora tenuis to moderate and strong light imitation in coastal waters	*Yes*	04/02/2020	https://www.sciencedirect.com/science/article/abs/pii/S0141113619300601?via%3Dihub	
		Outcomes Factsheet 1 - How do corals respond to different light conditions?	*Yes*	16/06/2020	https://nesptropical.edu.au/wp-content/uploads/2020/06/NESP-TWQ-Project-5.3-Outcomes-Factsheet-1.pdf	
		Outcomes Factsheet 2 - A New Water Quality Indicator for the Great Barrier Reef	*Yes*	16/06/2020	https://nesptropical.edu.au/wp-content/uploads/2020/06/NESP-TWQ-Project-5.3-Outcomes-Factsheet-2.pdf	
		Webinar Presentation - Benthic light as an ecologically-validated water quality indicator	*Yes*	16/06/2020	https://nesptropical.edu.au/wp-content/uploads/2020/06/benthic-light-as-an-ecologically-presentation-barbara-robson-lores.pdf	
		Webinar Video - Benthic light as an ecologically-validated water quality indicator	*Yes*	16/06/2020	https://youtu.be/lFys9aLRUs8	

5.4	Deriving ecologically relevant targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	Ecologically-relevant end of catchment sediment load reduction targets to meet seagrass desired state in the Burdekin Basin. This will include an assessment of how the methods can be applied across the GBR to evaluate sediment load targets. Thresholds for growth of seagrass including threshold tolerance to bed sheer stress and benthic light will be provided. Spatial data sets and metadata will also be uploaded to eAtlas for future access. Outputs will be compatible with source catchment and eReefs models Habitat classification spatial dataset, desired state for the GBR (species composition), and a framework outlining how this can be implemented in routine monitoring reporting. GBR seagrass dataset (NESP 3.1) will be updated with biomass, recent data (2015-2018) and uploaded to eAtlas. A plan for using the outputs in Outlook reporting will be developed in collaboration with the Outlook team and RIMReP, if requested.				
		Project Factsheet - Deriving ecologically relevant targets to meet desired ecosystem condition for the Great Barrier Reef: a case study for seagrass meadows in the Burdekin region	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/05/NESP-TWQ-Project-5.4-Factsheet.pdf	

5.5	Measuring aesthetic and experience values using Big Data approaches	Method for monitoring aesthetic and experience values to meet requirements for reporting (inc RIMRep). Provide a mechanism for using images posted to the Eye-on-the-Reef platform. Information sheet on the tourism-relevant aspects of coral restoration to be shared with tourism industry. Social media monitoring platform to measure and track visitor experience – to be implemented through RIMRep based on this proposed research. Research report/paper on how visitors perceive coral restoration as an adaptation measure. Information on eye tracking outcomes shared and input into potential product development provided with relevant groups. Target-specific sentiment analysis of visitors to the GBR.				
		Project Factsheet - Measuring aesthetic and experience values using Big Data approaches	*Yes*	01/06/2019	httphttps://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.5-Factsheet.pdf	
		Factsheet - Human dimensions of coral restoration	*Yes*	18/02/2020	https://nesptropical.edu.au/wp-content/uploads/2020/02/Coralrestoration_Final.pdf	
		Factsheet - Aesthetic and experience values First Nations People and the Great Barrier Reef	*Yes*	18/02/2020	https://nesptropical.edu.au/wp-content/uploads/2020/02/FirstNationsGBR-2.pdf	
		Technical Report - Target Sentiment and Target Analysis	*Yes*	18/02/2020	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.5-Technical-Report-1.pdf	
		CAUTHE Presentation - Integrating social sciences research with artificial intelligence (AI): a case study from the Great Barrier Reef	*Yes*	08/04/2020	https://nesptropical.edu.au/wp-content/uploads/2020/04/CAUTHE-presentation_NESP5.5.pdf	
		CAUTHE Paper - Integrating social sciences research with artificial intelligence (AI): a case study from the Great Barrier Reef	*Yes*	08/04/2020	https://nesptropical.edu.au/wp-content/uploads/2020/04/CAUTHE-2020.NESP-5.5-paper.pdf	
5.6	Designing the Aesthetics Long Term Monitoring Program (ALTMP)	Project Factsheet - Designing the Aesthetics Long Term Monitoring Program (ALTMP)	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.6-Factsheet.pdf	
		Conference Presentation - How do we assess and monitor aesthetic values of the Great Barrier Reef?	*Yes*	01/02/2020	https://nesptropical.edu.au/wp-content/uploads/2020/01/2019-12-02-1120-matt-curnock-great-barrier-reef-aesthetics.pdf	

		Journal Article - Beauty and the Reef: Evaluating the use of non-expert ratings for monitoring aestheitc values of coral reefs	*Yes*	21/05/2020	https://www.sciencedirect.com/science/article/abs/pii/S0048969720326735?via%3Dihub	
		Virtual Conference Presentation - Design of an Aesthetics Long-Term Monitoring Program for the Great Barrier Reef	*Yes*	22/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/MattCurnock_ISSRM-final-slide-deck-GBR-Aesthetics_July2020.pdf	
		Final Report - Designing an Aesthetics Long-Term Monitoring Program (ALTMP) for the Great Barrier Reef	*Yes*	22/07/2020	https://nesptropical.edu.au/wp-content/uploads/2020/07/NESP-TWQ-Project-5.6-Final-Report.pdf	
5.7	Assessment and communication of the spatial variability in bleaching severity throughout the Great Barrier Reef following back-to-back bleaching events in 2016 & 2017 (FAST TRACK PROJECT)	(i)a quantitative assessment of the spatial variability of severe coral bleaching and mortality throughout the Great Barrier Reef (GBR) on regional and within individual reef scales, (ii)a quantitative comparison of bleaching observations from a range of observers AIMS, GBRMPA, JCU Centre of Excellence and the GBRMPA COTS control team (implemented by AMPTO) which used a variety of methods and spatial assessments (iii)clear science communication and engagement with key stakeholder groups (tourist operators, reef managers and media outlets) in an effort to improve the communication and understanding of the variability and the spatial impacts of coral bleaching throughout the GBR.				
		Project Factsheet - Assessment and communication of the spatial variability in bleaching severity throughout the Great Barrier Reef following back-to-back bleaching events in 2016 & 2017 (FAST TRACK PROJECT)	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-5.7-Factsheet.pdf	
5.8	What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment and associated bioavailable nutrients	Tthe project reports will contain all the detailed information on the characterisation of the most detrimental sediment and how the work informs the RDI strategy. Results will also be disseminated through project meetings (project staff are also involved in some of these programs) and workshop presentations to ensure knowledge is transferred for informed decision making.				

		Project Factsheet - What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment and associated bioavailable nutrients	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-5.8-Factsheet.pdf	
5.9	Gully remediation effectiveness	In collaboration with the Reef Trust Technical Partners, an updated Gully Toolbox will be developed. Reports (and peer reviewed journal publications) containing quantitative data to support the 'effectiveness' of various remediation approaches.				
		Project Factsheet - Gully remediation effectiveness	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.9-Factsheet.pdf	
		Technical Report (interim) - Quantifying the effectiveness of gully remediation on water quality: preliminary results from demonstration sites in the Burdekin catchment (third wet season)	*Yes*	01/07/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/NESP-TWQ-Project-5.9-Technical-Report-1.pdf	
		Poster - The effectiveness of gully remediation on runoff and sediment loss: a review	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/8ISGE_Bartley_Poster_v4.pdf	
5.10	Development and application of automated tools for high resolution gully mapping and classification from LiDAR data	Produce a web-based database of Qld gullies Produce a report for wide circulation				
		Project Factsheet - Development and application of automated tools for high resolution gully mapping and classification from LiDAR data	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/07/NESP-TWQ-Project-5.10-Factsheet.pdf	
		International Gully Symposium Poster -	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/8ISGE_Poster_Stout.pdf	Additional output as a result of being asked to present at the 2019 International Gully Symposium.
		International Gully Symposium Presentation - Sick of digitising? Try this semi-automated method! A Multi Directional Hillshade extraction of continuous boundaries	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/8ISGE_Presentation_Curwen.pdf	Additional output as a result of being asked to present at the 2019 International Gully Symposium.
		International Gully Symposium Presentation - The Importance of being Erosion. Predicting future gully erosion from a single pass airborne LiDAR DEM	*Yes*	01/08/2019	https://nesptropical.edu.au/wp-content/uploads/2019/08/Presm_Presentation_JDaley.pdf	Additional output as a result of being asked to present at the 2019 International Gully Symposium.

5.11	Improved Water Quality Outcomes from On-Farm Nitrogen Management	Final Report on project findings; a decision support framework to assess N fertiliser best practice. Final Report on project findings that can prove an EEF dimension to broader program perspectives. A set of data intensive trials that can provide detailed technical support to broader EEF60 project results. Presentation of benefits of EEFs to extension officers				
		Project Factsheet - Improved Water Quality Outcomes from On-Farm Nitrogen Management	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-5.11-Factsheet.pdf	
		Peer-reviewed Conference Paper - Improved Water Quality Outcomes from On-Farm Nitrogen Management	*Yes*	14/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/Bell-Moody-Skocaj-Masters-Fries-Dowie.pdf	
5.12	Scoping land use conversion options for high DIN risk, low-lying sugarcane areas in Burdekin and Mackay Whitsunday regions	Economic information, GIS mapping, risk assessments around land use transition, and land use profitability Data and costing relationships produced				
		Project Factsheet - Scoping land use conversion options for high DIN risk, low-lying sugarcane areas in Burdekin and Mackay Whitsunday regions	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.12-Factsheet.pdf	
5.13	Coastal wetland systems repair across GBR catchments – Values Based Causal Framework validation	Meetings with DOEE to assist with development/ update of wetland reports, factsheets and guidelines generated by DOEE. Media factsheets, attending farmer information sessions, recreational fishing group presentations. Joint scientific publications generated. Preparation of factsheets containing information to forward to farmers/water customers. Reports and information available on the government GBR wetland website, and via GBR Wetlands Forum. Case study reports for each project site suitable for storage and dissemination through WetlandInfo				
		Project Factsheet - Coastal wetland systems repair across GBR catchments – Values Based Causal Framework validation	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/04/NESP-TWQ-Project-5.13-Factsheet.pdf	

5.14	Identifying the water quality and ecosystem health threats to the high diversity Torres Strait from the Fly River runoff	Plain English summaries of project outcomes. At least three community briefings on project outcomes (at Saibai, Boigu and Masig) at the end of the project, or as appropriate (to be determined in consultation with TSRA). Presentations and briefing paper to Torres Strait Environmental Management Committee meetings Final technical report. Summary products suitable for communicating the overall project results to a policy audience.				
		Project Factsheet - Identifying the water quality and ecosystem health threats to the high diversity Torres Strait from the Fly River runoff	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/06/NESP-TWQ-Project-5.14-Factsheet.pdf	
		Island Summary Factsheet - Boigu & Saibai	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.14-Island-Summary-Saibai-Boigu.pdf	
		Island Summary Factsheet - Bramble Cay	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.14-Island-Summary-Bramble-Cay.pdf	
		Island Summary Factsheet - Erub	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.14-Island-Summary-Erub.pdf	
		Island Summary Factsheet - Masig	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.14-Island-Summary-Masig.pdf	
		Island Summary Factsheet - Warraber, Iama & Poruma	*Yes*	30/05/2019	https://nesptropical.edu.au/wp-content/uploads/2020/02/NESP-TWQ-Project-5.14-Island-Summary-Warraber-Iama-Poruma.pdf	
5.15	eAtlas extension: Data management for environmental research	Mockup of elements of the RIMReP information portal (non-functional visualisation of how aspects of the site might work). Prototype elements of the RIMReP				
		Project Factsheet - eAtlas extension: Data management for environmental research	*Yes*	01/06/2019	https://nesptropical.edu.au/wp-content/uploads/2019/05/NESP-TWQ-Project-5.15-Factsheet.pdf	