Tropical Water Quality Hub

National Environmental Science Programme

Reef & Rainforest RESEARCH CENTRE

Annual Progress Report #2

1 January 2016 - 31 December 2016



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

NESP ANNUAL PROGRESS REPORT # 2
1 January 2016 – 31 December 2016

Section 1. Hub information

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; Australian Institute of Marine Science; Central Queensland University; CSIRO; Griffith University; University of Queensland

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This annual progress report comprises three parts:

A. **Certification** by the hub leadership that, in all material respects, the report is complete and accurate and that funding conditions have been met and that risks to research delivery have been notified to the Department;
B. **Performance information** – describing in qualitative and quantitative terms progress against the Research Plan; and
C. **Financial information** - demonstrating that funds have been used for the purpose for which they were provided.

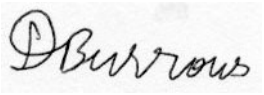
A: HUB CERTIFICATION

Section 2. Certification by Hub Leadership

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;
- any carryover of project funds have been allocated to projects in the next reporting period or financial year in accordance with the approved Research Plan or funds identified for refund to the Department; and
- full payment for this milestone by the Department is recommended on the basis that the milestone has been successfully achieved.

Signed: 

Hub Leader Name: Professor Damien Burrows

Date: 29 March 2017

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 draft progress report was discussed have been adequately resolved, amended or incorporated into the final report submitted to the department.

Signed: 

Hub Steering Committee Chair Name: Russell Reichhelt (steering committee member) on behalf of the Chair Leith Boully

Date:8 May 2017

B: PERFORMANCE INFORMATION

Section 3 -Performance against Funding Agreement Milestones

Have all milestones for the reporting period and to date been met? Yes

Milestones 1 – 13 of the NESP TWQ Hub Funding Agreement have all been met during the reporting period (1 January 2016 – 31 December 2016) by the Hub Administrator – Reef and Rainforest Research Centre.

Section 4 – Hub level Risk Management

Are the risks identified in the Hub risk management plan being actively managed? Yes

TWQ Hub processes in place for the ongoing management of risk are:

- The Hub Leader, Hub Steering Committee, Hub Science Advisory Committee and Hub Administrator work closely together to meet all deadlines.
- Processes are in place to link project milestone delivery to institutional payments.
- The demonstrated history of timely delivery in tropical conditions by project leaders is considered in the assessment of project proposals.
- Regular communication with regional stakeholders for their input into research priorities is undertaken. A stakeholder workshop was held over two days in Brisbane (1-2 June 2016) to discuss research priorities for the Round 3 Project Selection.
- The Hub employs a professional communications officer for production and distribution of media, a skilled knowledge broker and a graphic design professional for multi-media (e.g. print, web, social).
- The Hub provides high quality communication product branding and assists projects to distribute varied communication outputs as outlined in project proposals.
- In February 2016, a Hub Project Leaders workshop was held in Townsville. The workshop outlined the contractual obligations of the Project Leaders, the Hub Administrator, Hub Steering Committee, Indigenous engagement expectations, data repository obligations, and collaboration and reporting requirements.
- The Hub Administrator has employed a skilled knowledge broker, Suzanne Long as Program Director.

Have the actions identified in the Hub risk assessment and treatment plan, submitted with research plan version 2, been completed within the stated timeframe? Yes

Identified risk	Impact	Proposed risk treatment	Due date	Risk rating after treatment	Revised risk rating
Inability of the Hub to meet objectives due to loss of research, administrative and/or KB and Comms skills in the region that are necessary to perform the functions identified	Ongoing uncertainty of future employment may lead to loss of capacity before or early into the program, which is	Hub Steering Committee, Hub Science Advisory Committee and Hub Administrator working closely together to meet all deadlines	31-Dec-18	Medium	Low

in the Research Plan V2	difficult to replace or results in costly delays				
Hub program not delivered on time and not of the expected quality	Force majeure events may delay program delivery.	Understand previous delivery history of project leaders selected	31-Dec-18	Low	Low
Hub program not delivered on time and not of the expected quality	Uncoupling project milestone delivery from the financial management may reduce the inducements to ensure timely and effective delivery.	Processes in place to ensure payment is made on delivery of milestones	31-Dec-18	Medium	Low
Hub program not delivered due to erosion of trust between researchers and end-users.	Inability of regional stakeholders to recognise their priorities in the Program	Communicate with regional stakeholders from beginning of NESP program and value their input	31-Dec-18	Low	Low
Hub program not delivered due to erosion of trust between researchers and end-users.	Culturally inappropriate engagement with Indigenous communities	Ensure all researchers have completed a cultural awareness course offered by their or another institution; all researchers to be made aware of the AIATSIS Guidelines; relevant researchers to be made aware of Torres Strait cultural protocols for research	31-Dec-18	Low	Low
Poor transfer of Hub outputs/outcomes to end-users of knowledge and/or tools	Low quality of outputs and/or reliance on narrow range of products (e.g. over reliance on	Hub Administrator to provide high quality communication product branding; selected projects to have varied communication	31-Dec-18	Low	Low

	written reports).	outputs outlined in project proposal			
Poor transfer of Hub outputs/outcomes to end-users of knowledge and/or tools	Hub relies on passive knowledge transfer mechanisms to distribute new understanding or capabilities	Hub Administrator to employ skilled knowledge broker	31-Dec-18	Low	Low

Section 5- Description of work undertaken during the reporting period

Overview

During the reporting period, the TWQ Hub funded projects to meet the Minister's research priorities and key end user and stakeholder research needs. During 2016, 18 RPv2 multi-year projects commenced and the selection of 16 RPv3 multi-year projects was finalised.

As stated in the Tropical Water Quality Hub research scope, Activity Outcomes include:

- Coastal management (including rivers and streams) and risk abatement for environmental impacts on tropical water quality from infrastructure, agriculture, extreme events and biosecurity threats;
- Management, monitoring and reporting for coastal species including status, trends and threatening processes; and
- Practical delivery of tropical water quality trials.

The Tropical Water Quality Hub provides innovative research for practical solutions to maintain and improve tropical water quality from catchment to coast. Research has focussed on mitigating water quality impacts, predicting indirect and cumulative effects of human activities, and providing optimised management by engaging research-users in a collaborative process to co-develop projects. Current and emerging priority areas for research include:

- Crown-of-thorns (CoTS) starfish outbreak mitigation;
- Cumulative catchment, coast and marine impacts & habitat repair;
- Sediment and nutrient dynamics;
- Indigenous co-management of cultural keystone species & habitats; and
- Developing the framework for optimisation and investment prioritisation.

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Project Funding

The TWQ Hub continued to expand its research portfolio to address the Minister for the Environment's research priorities and stakeholder research priorities. The Hub once again used an open call process to attract multi-year research project proposals. Research Plan v1 projects were completed and delivered expected outputs and outcomes. The Research Plan v2 multi-year projects selected to commence on or after the 1st January 2016, were focused on priorities of Reef 2050 Long Term Sustainability Plan and Reef Trust. The Hub committed $6.87M NESP cash to 18 projects with co-contributions totalling $10.33M. The call for Research Plan v3 multi-year projects opened on the 1st July and closed on the 19th August 2016. The call attracted 20 project proposals requesting a total of $6.7M. Based on recommendations from the Hub Scientific Advisory Committee and final discussion by the Hub Steering Committee, $5.6M was committed to 16 projects with co-contributions totalling $7.74M. These projects commenced on 1st January 2017.

The projects funded under the TWQ Hub are contributing to the intended scope of the Hub and are further contributing to the majority of the Minister's research priorities.

Completion of Research Plan v1 Projects
Short-term Research Plan v1 projects were all completed by the 30 March 2016 with only one exception being Project 3.1.2 which was approved for completion on 10 June 2016 at the request of the Department of the Environment – Reef Trust team. All projects submitted at least one final technical report. All outputs were circulated to identified end users and stakeholders within one month of submission. Significant outcomes from these projects include:

- A management-focused qualitative model to determine the optimal trade-off between investment into surveillance versus investment into COTS control activities in the GBR.
- A pilot sub-catchment scale monitoring, modelling and extension program, based on an end-user workshop, existing risk assessments, monitoring and modelling programs designed for Great Barrier Reef (GBR) water quality improvement.
- A 'synthesis of current knowledge of the biophysical impacts of dredging and disposal on the GBR' to inform the NESP dredging research investment framework.
- Continued long-term monitoring at 20 sites in the Keppel Islands in the southern GBR, that experienced successive climatic disturbance events.
- Seagrass mapping synthesis of over 320 separate data sets has been undertaken and made available on eAtlas.
- Demonstrating that zoning on coral reefs and their associated fish communities in the Great Barrier Reef Marine Park concur with the overall findings of long-term surveys on the GBR since 2006 that protection from fishing has a clear effect on target species, but few indirect effects on other components of the reef community.
- Development of an offset financial contribution calculator for Reef Trust. The prototype is an easy-to-use excel calculator that is based on terrestrial offset calculators used in Australia and international best practice, but adapted for the GBR context.

Research Plan v2 Project Leaders Workshop
The Project Leader workshop for Research Plan v2 was conducted on the 12th February 2016 with all Project Leaders. The objectives of the hub and collaborations between projects were emphasized. Specific end user and indigenous engagement strategies were addressed with a workshop on communications and knowledge brokering to assist projects in meeting their research goals over the next twelve months. The specific focus was ensuring all project all Project Leaders understood their roles and responsibilities within the Hub while providing an avenue for effective engagement and collaboration.

Approval of Research Plan v3
Research Plan v3 was submitted to the Department of the Environment and Energy on the 19th September 2016. Research Plan v3 was approved by the DoEE on the 21 December 2016.
As mentioned above, 16 projects have been approved for commencement on 1st January 2017 (2 projects will commence on 28th January (Project 3.3.2) and 15th February (Project 3.3.3). New innovative projects particularly addressing end user needs include water quality credit trading; economic levers for underwriting risk in practice change; water quality metrics for reef report cards and three projects specifically focused on the human dimension of the Great Barrier Reef. This is in response to meeting connections of the values outside of the established GBRMPA as a whole of systems approach.

Project completion in 2016

A Project Completion template is provided as **Attachment A** and provides a summary of achievement against objectives, activities undertaken, budget and expenditure, outputs and links to products.

Upcoming highlights over the next 6 to 12 months

Key research highlights or activities expected under the TWQ Hub over the next six to 12 months include:

1. Eight projects funded under Research Plan v2 will conclude by the end of 2017, providing a range of outputs for dissemination and promotion, including at least 10 technical reports.
2. Project 2.3.2 Dr Susanne Becken - The 'Big Data' online Monitoring Tool will be rolled out in December 2017 and uses citizen science in combination with traditional monitoring methods to monitor environmental change on the GBR. In this project, human sensors (visitors, Indigenous residents or others) have been used to collect information complementary to traditional scientific measurements and monitoring, advanced data mining capability and an online tool together can contribute to the improvement of water quality.
3. Project 25 is set to be enhanced by CSIRO joining the project as new research collaborators. This injection will introduce broader monitoring effort and trial the introduction of remotely-operated sensors and data-sharing networks.
4. The Hub has invested heavily in research to support the Crown of Thorns Starfish control program. This research has greatly improved the search patterns and killing efficiency of the field control teams which work closely with Hub researchers, implementing research outcomes. A second CoTS control vessel has been funded by the federal government, enabling Hub research outputs to be even more effective. In turn, the second boat and field team will also supply more information back to Hub researchers.
5. The Hub is co-sponsoring and co-organising an Australian Coastal Restoration Symposium (31 Aug-1 Sep 2017) in Townsville. This will be the first event of its kind and it is hoped that this will become an annual event. The symposium includes invited international speakers and is a cross-hub joint undertaking the Marine Biodiversity Hub and The Nature Conservancy.
6. The Hub is joining with the NAER, Marine and ESCC hubs to develop a project responding to the Gulf of Carpentaria mangrove dieback - the largest mangrove dieback event ever recorded in the world. This project now includes ~$600K of cash investment from three NESP hubs and four other partners. The project has already generated considerable national and international media attention and will continue to do so as its fieldwork and outcomes progress.
7. Due to two consecutive seasons of severe coral bleaching on the GBR, we are planning on adjusting the direction of at least some of our research effort and investment planned for Research Plan v4 to directly address this issue. Our work is likely to focus on solutions, management actions or planning activities, that can be implemented in the short-term. This may include direct physical interventions on parts of the reef, something rarely attempted to date. This will demonstrate that the TWQ Hub can respond in a timely manner to emerging issues.

Section 6 - Progress against the Research Plan (incl. whether milestones and timeframes are being met) and risks to delivery

Does the hub confirm that hub project progress and performance is in accordance with the approved Research Plan and Funding Agreement, including timing and milestones? No

Within the reporting period 1 January - 31 December 2016, one project required an extension to its completion date. This was approved by the Hub Leader as detailed below.

Project ID	Milestone	Date due	Reason for delay	Remedy/response	*Revised date*	*Impact of delay on Research Plan*
Project 2.1.2	Final Report detailing the evaluation and identification of options for cost-effective, low/no nitrogen input and alternatives for marginal cane lands to reduce nitrogen loads to the GBR.	28 Feb	Due to the sensitivity of the results and the importance of the key messages of this project researchers requested and extension of time to work with end user groups to ensure a transparent and well-informed delivery of the final report, before wider public release.	Extend due date by six weeks. Approved by Hub leader 22nd February 2017.	14 April 2017	Nil. There are no anticipated impacts from this extension on the Hub Research Plan or other projects within the Hub. This is a final report and there are no subsequent milestones to be met.

Please identify any known risks to future delivery against the agreed Research Plan (not previously advised by the Department), or where previously identified risks have been realised, or moved to a higher risk rating.

There are no foreseen risks to future delivery against the agreed Research Plan v3 and all risks identified in research Plan v2 have been rectified.

Section 7 - Key Performance Indicators

Table A: NESP Key Measures Table

Key Performance Indicator	Hub Result for 12-month Period (numerical only)	Explanation (if any)
1. Total number of stakeholder workshops/formal meetings: Sub-measures: • Number of those interactions that include with Environment Department or Portfolio staff • Number of those interactions that include senior executives, the Commonwealth Minister for the Environment and Energy or ministerial advisers	Total: **54** Total: **52** Total: **2**	workshops/ formal meetings workshops/ formal meetings Workshops/ formal meetings Meeting with Hon. Minister Greg Hunt (Project 2.1.7) - 3 May 2016 Reef Aid Launch, Sydney Opera House attended by Hon. Minister Greg Hunt (Project 2.1.10)
2. Total number of stakeholder workshops/formal meetings with State and local Government Sub-measure: • Number of those interactions that include state/local government senior executives, a State Minister or local mayor or councillor or their advisers	Total: **58** Total: **1**	workshops/ formal meetings meeting with Hon. Minister Dr Steven Miles (Project 2.1.10)
3. Number of stakeholder workshops/formal meetings with parties external to Government	Total: **87**	workshops/ formal meetings
4. Number of workshops/formal meetings with other NESP hubs to further hub objectives	Total: **13**	workshops/ formal meetings
5. Number of cross-disciplinary meetings held between hub consortium members to further hub objectives	Total: **25**	workshops/ formal meetings
6. Number of research outputs provided to end users **on time**[1] and as identified in the Research Plan	Total: **24**	research outputs
7. Proportion of research outputs provided to end users **on time** and as identified in the Research Plan	**100%**	
8. Number of instances of where the hub has used NESP-generated information from another NESP hub.	Total: **5**	Uses of NESP generated information from another Hub Project 2.3.5; Project 2.1.10; Project 2.2.1; Project 2.2.2; Project 2.3.3
9. Number of peer reviewed NESP-funded publications during the reporting period	Total: **21**	Peer reviewed NESP-funded publications

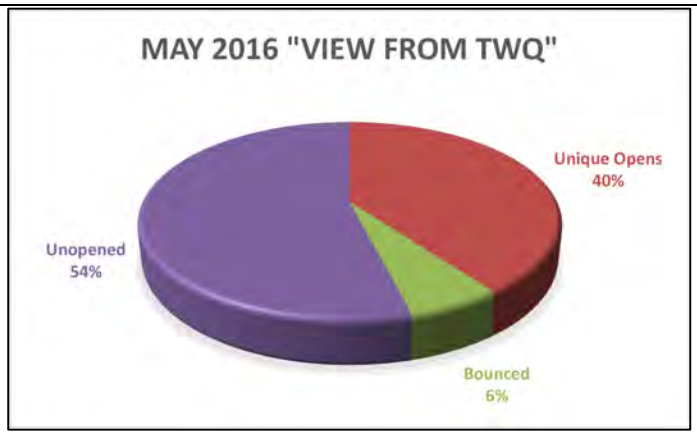
[1] On time – delivered on the date the outputs were expected to be delivered

Key Performance Indicator	Hub Result for 12-month Period (numerical only)	Explanation (if any)
10. Number of NESP research citations in other researchers' publications during the reporting period	Total: **34**	Research citations
11. Number of researchers, including PhD and Post-Doc positions engaged as a result of NESP (total, Full-time equivalent) during the reporting period	Total: **139** researchers FTE: **25.375**	
12. Percentage of NESP research outputs (including publications, data and metadata) that are discoverable and accessible in accordance with NESP data accessibility requirements and the funding agreement.	**100%**	Publications, fact sheets, articles, data, metadata.

Knowledge Brokering and Communication

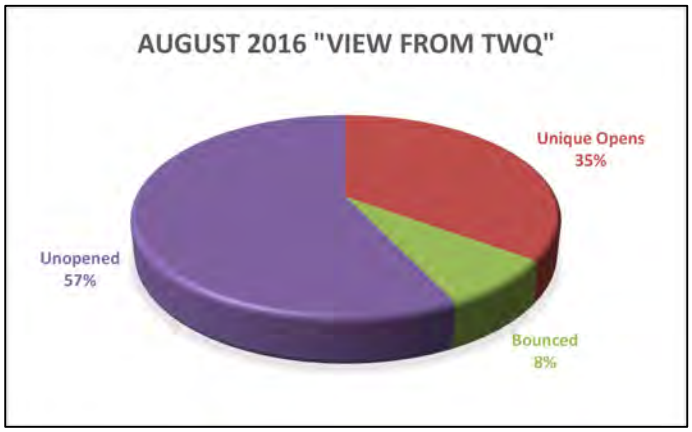
Medium term (Years 2 – 3) Activities	Outcomes
Work with researchers to develop information sheets for multi-year projects and technical reports reporting each projects results	The Hub worked with Research Plan v1 and Research Plan v2 projects to develop, brand and publish information sheets, project factsheets and technical reports throughout the reporting period. • 1 Information sheets • 21 Project factsheets • 3 Technical reports
Maintain and update contacts database 6-monthly	The Hub continues to maintain, update and expand its contact distribution database. The database comprises: • Project research team members • End users • Hub Steering Committee members • Hub Scientific Advisory Committee members • GBR Water Science Taskforce • GBR Foundation Scientific Advisory Committee • Reef 2050 Advisory Committee • Gladstone Healthy Harbour Partnership Independent Science Panel Currently, the database has approximately 380 contacts. The database will be updated again in early 2017.
Facilitate targeted workshops, meetings and networking events as required based on topical and end-user needs	The TWQ Hub facilitated **2** targeted workshops: • 10 February 2016 – RPv2 Project Leaders Workshop, Townsville • 2 June 2016 – TWQ Hub End user workshop, Brisbane (42 Attendees).
Coordinate annual Hub conferences	Nil Hub Annual Conferences were held during the reporting period.
Ongoing workshops and	**1** meeting was held with Dawul Wuru Aboriginal Corporation Yirrganydji Rangers to assist engagement with Project 2.2.3.

meetings with TO groups to facilitate engagement with NESP projects	Various discussions were held with Jaragun regarding their Project Connectivity Wetlands Project.
Work with researchers and government to draft media releases for topical and novel findings, as required	During the reporting period, the TWQ Hub distributed **16** media releases: • "Tropical Water Quality Hub to help keep Reef clear of plastic waste": Media Release – 29 February • "Australia initiates research on how to reduce plastic pollution" mentioned in media story – 1 March • "Research on early warning system for Irukandji" – Media release • "Diverse Steering Committee helps TWQ Hub" Media release – 24 April • "Great Barrier Reef Water Quality Projects to be fully funded by Commonwealth: Greg Hunt" mentioned in media story – 26 April • "Farming Groups welcome Reef funds but calls remain for more accurate water quality data" – Media mention 27 April • "Harnessing the market to reduce coastal run-off" Media Release – 23 May • "RRRC welcomes $1b Reef Funding Pledge" – mentioned in media story – June 20 • "Project 25: Putting the future of water quality back in growers' hands" – Media release 7 July • "New project giving farmers an active role in Reef protection" media story - 18 July • "Project 25 – NESP Tropical Water Quality Hub" promotional video released on Youtube – 1 August • "Can a single region in Florida show the state how to adapt to climate change?" mentioned in media story – 19 August • "New fertilizers to protect Reef and sugarcane farm profitability" media story – 13 October • "Smile, you're on stinger camera" media story – 25 October • "Research Centre celebrates decade of delivering for tropics" – Hub mentioned in media story - 18 November. • "Great Barrier Reef operators 'bloody relieved' at coral recovery" Hub mentioned in media story – 29 November
Update website and add new information as it is available	The TWQ Hub website is continually updated and new information is uploaded as it becomes available.
Prepare and distribute quarterly e-newsletters in consultation with DoEE; maintain active and regular social media presence	**3** issues of *View on TWQ* eNewsletters were distributed within the reporting period: • May (Issue 8) • August (Issue 9) • December (Issue 10) **Issue 8:** • Sent to **378** unique subscribers • Opened by **151 (39.9%)** unique subscribers a total of **362** times • Unopened by **204** subscribers • **23** bounced • **75 (49.67%)** subscribers who opened the campaign also clicked links a total of **157** times that took them to the full e-newsletter articles on the NERP TE Hub website.



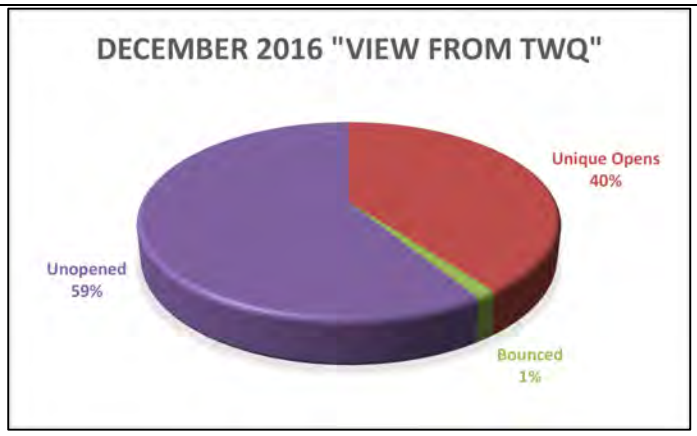
Issue 9:

- Sent to **394** unique subscribers
- Opened by **138 (35%)** unique subscribers a total of **576** times
- Unopened by **225** subscribers
- **31** bounced
- **51 (37%)** subscribers who opened the campaign also clicked links a total of **98** times that took them to the full e-newsletter articles on the NERP TE Hub website



Issue 10:

- Sent to **369** unique subscribers
- Opened by **147 (39.8%)** unique subscribers a total of **403** times
- Unopened by **217** subscribers
- **5** bounced
- **42 (28.6%)** subscribers who opened the campaign also clicked links a total of **79** times that took them to the full e-newsletter articles on the NERP TE Hub website.

	 The Hub actively maintains a social media presence through **Facebook** and **Twitter**.
Review IEPS annually and update as needed; Implement communication actions	The IEPS was reviewed during the reporting period. In order to ensure the process for the engagement of Traditional Owners within the NESP TWQ Hub research projects are clearly defined, the Hub Administrator created three category levels of Traditional Owner engagement which are proposed to match the type and methodology defined in each individual project proposal. The definition of a **Category One** project, is a research proposal that is anticipated to be undertaken with direct collaboration with an Indigenous community, organisation, group or individual. As per the NESP TWQ Hub IEPS, a Category One project will be expected to: • Clearly identify how the research will be relevant and of benefit to Indigenous communities and/or organisations. • Demonstrate how the research is to be conducted according to the highest ethical standards and respects Indigenous priorities and values. • Demonstrate how the research will provide opportunities for Indigenous engagement, employment, skills transfer, sharing of knowledge and the increase of cultural awareness amongst all parties. • Develop a process for the generated knowledge, data and research results to be effectively shared and communicated between Indigenous peoples, communities and organisations. The definition of a **Category Two** project, is a research proposal that has a field component within the project, but does not have direct collaboration with an Indigenous community, organisation, group or individual. As per the NESP TWQ Hub IEPS, a Category Two project will be expected to: • Clearly identify how the research will be relevant and of benefit to Indigenous communities and/or organisations and if not why. • Demonstrate how the research will provide opportunities for Indigenous engagement, employment, skills transfer, sharing of knowledge and the increase of cultural awareness amongst all parties and if not why. • Develop a process for the generated knowledge, data and research results to be effectively shared and communicated between Indigenous peoples, communities and organisations. The definition of a **Category Three** project, is a research proposal that is lab or desktop based and does not have direct collaboration with an

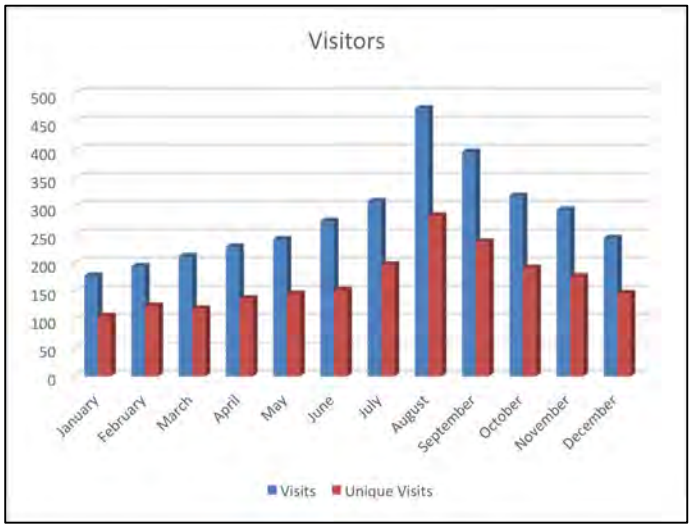
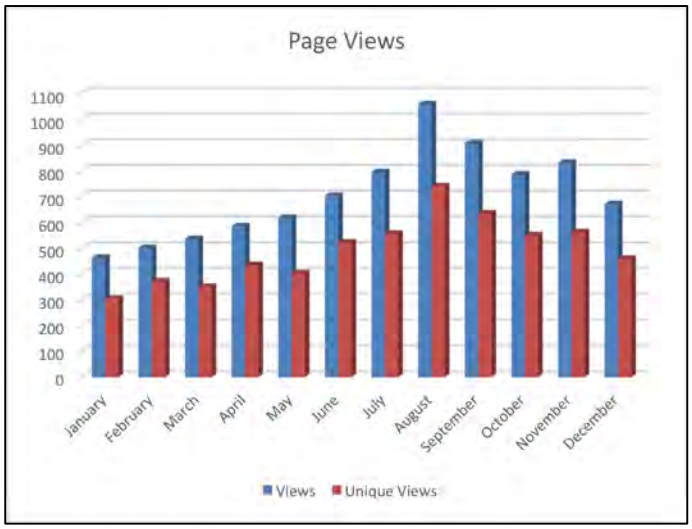
<table>
<tr><td></td><td>Indigenous community, organisation, group or individual. As per the NESP TWQ Hub IEPS, a Category Three project will be expected to:
Develop a process for the generated knowledge, data and research results to be effectively shared and communicated between Indigenous peoples, communities and organisations.</td></tr>
<tr><td>Biannual Steering Committee meetings or more frequently as required to communicate findings and discuss strategic direction of Hub</td><td>The Hub Steering Committee met 3 times during the reporting period.
Meeting No. 5 – 15th March, Cairns
Meeting No. 6 – 3rd June, Brisbane
Meeting No. 7 – 8th September, Cairns</td></tr>
<tr><td>Prepare project or topic specific policy briefings as Year 1 project results are available</td><td>Project 3.9 (Ro Hill) – Briefed DoEE and GBRMPA during the reporting period, Canberra.

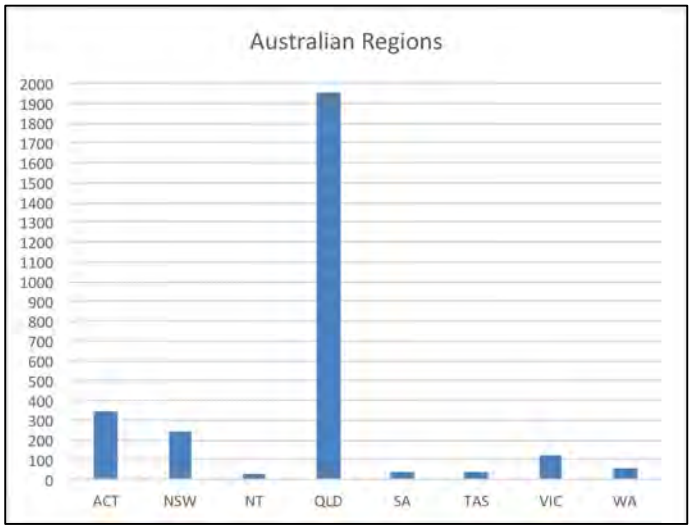
In addition, the Hub held 46 policy briefing meetings with numerous end users and stakeholders throughout the reporting period
<table>
<tr><th>Date</th><th>Met</th><th>Topic</th><th>Place</th></tr>
<tr><td>29 Jan 16</td><td>Qld Minister for Environment & Great Barrier Reef, the Hon. Dr Steven Miles</td><td>Water Quality Projects</td><td>Brisbane</td></tr>
<tr><td>04 Feb 16</td><td>Various Stakeholders including Qld Government, Canegrowers, Wet Tropics Management Authority</td><td>Wet Tropics Healthy Waterways Partnership – linkage of NESP TWQ Hub Projects</td><td>Cairns</td></tr>
<tr><td>08 Feb 16</td><td>Qld Chief Scientist, Dr Geoff Garrett</td><td>NESP TWQ Hub Projects – GBR projects</td><td>Cairns</td></tr>
<tr><td>16 Feb 16</td><td>Key stakeholders including Canegrowers, tourism industry and research institutions</td><td>Overview of Projects and the NESP TWQ Hub</td><td>Cairns</td></tr>
<tr><td>18 Feb 16</td><td>The Hon. Warren Entsch & the Hon. Josh Frydenberg (as Minister for Northern Australia)</td><td>Overview of Projects and the NESP TWQ Hub and importance for Northern Australia</td><td>Cairns</td></tr>
<tr><td>24 Feb 16</td><td>GBR Review Group Committee</td><td>GBR and WQ projects</td><td>Brisbane</td></tr>
<tr><td>25 Feb 16</td><td>NESP Fly River & Torres Strait Projects Team meeting</td><td>Linkages of projects</td><td>Cairns</td></tr>
<tr><td>26 Feb 16</td><td>Mayor Bob Manning – Mayor of Cairns Regional Council</td><td>Overview of NESP TWQ Hub</td><td>Cairns</td></tr>
<tr><td>03 Mar 16</td><td>Regional Water Forum</td><td>Linkages of WQ Projects</td><td>Brisbane</td></tr>
<tr><td>04 Mar 16</td><td>Chair of the Florida Everglades Program</td><td>Similarities of the GBR and WQ issues</td><td>Cairns</td></tr>
<tr><td>08 Mar 16</td><td>Alex de Waal, CEO of Tourism Tropical NQ</td><td>Update of NESP TWQ Projects</td><td>Cairns</td></tr>
</table></td></tr>
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10 Mar 16	Qld Minister for Environment & Great Barrier Reef, the Hon. Dr Steven Miles	Participated in a round table discussion on GBR matters	Brisbane
14 Mar 16	FNQ Canegrowers	Extension Project	Gordonvale
08 Apr 16	Tourism Australia	GBR projects	Cairns
03 May 16	The Hon. Greg Hunt (as Minister for the Environment)	NESP TWQ Hub	Canberra
05 May 16	The Hon. Julie Bishop (Minister for Foreign Affairs)	NESP TWQ Hub overview	Canberra
09 May 16	Mr Col McKenzie, CEO of AMPTO	NESP Round 2 Projects and linkages with the CoTS Program	Cairns
12 May 16	GBRMPA	NESP Round 2 Projects and linkages with the CoTS Program	Cairns
17-18 May 16	Presented at the ATE16 Conference	Presented with Russell Reichelt to the tourism conference regarding coral bleaching	Gold Coast
03 June 16	Queensland Tourism Industry and Qld Chief Scientist	NESP TWQ Hub Projects	Brisbane
09 June 16	Stakeholders and project leaders and project team members	NESP CoTS Workshop	Townsville
16 June 16	DoE	NESP TWQ Hub reporting	Canberra
	NESP Hubs and DoE	Research Priorities Workshop	Canberra
17 June 16	CEO of AMPTO	Coral bleaching	Cairns
22 June 16	GBRMPA and stakeholders	Attended GBRMPA function	Cairns
29 June 16	CEO of Tourism Tropical NQ & CEO of Ports North	Coral Bleaching, dredging impacts, and NESP Projects	Cairns
30 June 16	Elisa Nichols – Qld Department of the Great Barrier Reef	Coral bleaching and NESP Projects	Cairns
06 July 16	Advance Cairns Members	Attended function	Cairns
07 July 16	CEO of Canegrowers Queensland, Dan Galligan	NESP Projects	Brisbane
20 July 16	Various stakeholders	Attended the Reef Water Quality Forum	Brisbane
05 Aug 16	COE of Terrain NRM, Carole Sweatman	WQ projects	Cairns
08 Aug 16	Various stakeholders and researchers	CoTS Workshop	Townsville
	GBRMPA	CoTS; NESP Projects	Townsville
12 Aug 16	WWF & AMCS representatives	NESP Projects	Townsville

29 Aug 16	CEO of AMPTO	Marine Tourism priorities for future NESP research	Cairns
30 Aug 16	NESP TWQ Hub SAC members	NESP TWQ Hub SAC meeting for Round 3 proposals	Townsville
06 Sept 16	Various stakeholders	Attended the Launch of the GBR Marathon Festival	Port Douglas
09 Sept 16	Farmers	Fertilizer industry meeting	Innisfail
12 Sept 16	The Hon. Josh Frydenberg, Minister for the Environment & Energy	NESP TWQ Hub and CoTS	Canberra
14 Sept 16	Various farmers and government officials	Presented at the Australian Fertiliser Industry Conference	Cairns
23 Sept 16	FNQ Canegrowers	Effects of fertilisers on the reef	Cairns
04 Oct 16	Directors' meeting	Citizens of the Great Barrier Reef meeting	Cairns
05 Oct 16	The Hon. Josh Frydenberg, Minister for the Environment & Energy, and GBRMPA	Visit to Green Island	Cairns
03 Nov 16	The Hon. Chris Bowen (Shadow Treasurer) and Senator Anthony Chisholm and marine tourism industry	Overview of NESP TWQ Hub and CoTS	Cairns
09 – 11 Nov 16	Project leaders and project team members and stakeholders	Attended the Reef Science Synthesis Workshop	Townsville
25 Nov 16	Cairns Industry Leaders	NESP projects	Cairns
15 Dec 16	Directors' meeting	Citizens of the Great Barrier Reef meeting	Cairns

Collaboratively review research priorities and update Research Plan	The TWQ Hub facilitated **1** targeted workshop: • 2 June 2016 – TWQ Hub End user workshop, Brisbane (42 Attendees) to discuss research priorities for RPv3.
Capture meta-data for all TWQ Hub investments on e-Atlas; Provide all users with free and easy access to all Hub generated knowledge, especially complex spatial data via web browser interfaces not requiring complex GIS skills	The eAtlas (managed by AIMS) is the TWQ Hub data repository. The Hub has included eAtlas milestones for each reporting period (6-months) in consultation with eAtlas. This is to ensure all project meta-data generated by the Hub investment is captured. During the reporting period, available meta-data and spatial mapping of project locations was received from RPv1 projects.
As per Hub reporting	Completed and included in this Annual Report.

requirements, prepare 6 project case studies annually for circulation	
Science Week, Canberra (2016, 2017)	The NESP TWQ Hub did not participate in Science Week 2016 in Canberra.
Facilitate targeted forums for detailed consideration of scientific outputs and future directions	
NESP TWQ Hub website analysis	**NESP TWQ Hub Website - Number of Visitors** Total number of visitors, January-December 2016 was **3377** Total number of unique visitors, January -December 2016 was **2026**  **NESP TWQ Hub Website – Number of Page Views** Total number of page views, January-December 2016 **8454** Total number of unique page views, January-December 2016 **5918** 

	NESP TWQ Hub Website - Location of Visitors The total number of countries / territories that visitors accessed the website from was **45**. These were (with % of times accessed in brackets): Australia (83.6%), India (4.7%), United States (3%), Italy (1.7%), Germany (0.7%), United Kingdom (0.6%), New Zealand (0.6%), Others (5.1%). **NESP TWQ Hub Website - Location in Australia of Visitors** Total number of Australian based visitors, January-December 2016 was **2823.** These were (with total of times accessed in brackets): ACT (342), NSW (242), NT (32), QLD (1956), SA (38), TAS (33), VIC (123), WA (56)  **NESP TWQ Hub Website – Referred Traffic** Of the **3377** visits to the website, the total number of visitors from referred traffic was **1891**. Referrals came from (with number of times referred in brackets): rrrc.org.au (412), reeflplan.qld.gov.au (274), environment.gov.au (201), plus.google.com (147), facebook.com (104), gbrmpa.gov.au (74), csiro.au (64), eatlas.org.au (53), others with less than 30 referrals made up the rest.
The Chirp submissions	A total of **45** Chirp articles were submitted by the NESP TWQ Hub to the DoEE: • Developing an Integrated Monitoring System to meet the LTSP targets (Project 3.8); • Post-review of the Lower Burdekin WQ Tender (Project 1.5); • A research investment framework for capital dredging (Project 1.9); • An investment framework to support jellyfish research (Project 3.6); • Mapping seagrass meadows of the GBR (Project 3.1); • Seagrass Indicators for Reef Health (project 3.4); • Diverse Steering committee helps TWQ Hub; • Cost-effectiveness of Reef pollution reduction targets (Project 3.10); • Publication - Fabricius, K. E., Logan, M., Weeks, S. J., Lewis, S. E. & Brodie, J. (2016) Changes in water clarity in response to river discharges on the Great Barrier Reef continental shelf: 2002–2013. Estuarine, Coastal and Shelf Science (NERP TE Hub Project 4.1);

	• The design of a nitrogen trading scheme for North Queensland (Project 2.2); • How effective are riparian zones in reducing erosion and runoff? (Project 1.2); • Defining light thresholds for healthy seagrass (Project 3.3); • New management strategies for Crown of Thorns (Project 1.1); • Seagrass and dugongs in the Torres Strait (Project 3.5); • Final report of TWQ Research Plan 1 outputs released; • A coordinated approach for Traditional Owner sea country management (Project 3.9); • Comprehensive reef mapping of Torres Strait (Project 3.13); • Storms undermine green-zone progress on Great Barrier Reef (Project 2.1); • Improved approaches for GBR multiple and cumulative impacts (Project 1.6); • An analysis of Great Barrier Reef management systems (Project 3.11); • Targeting Water Quality Hotspots (Project 1.8); • Managing alluvial gully erosion (Project 1.7); • Calculating financial offsets for Reef Trust (Project 3.12); • Improved estimates of Torres Strait dugong and turtle populations (Project 3.2); • Working with Torres Strait Communities to Track Marine Turtles and Dugongs (Project 3.2); • Seek and destroy: Surveillance and control of Crown-Of-Thorns Starfish (Project 2.1.1); • For the record: Preserving environmental data in the eAtlas (Project 3.13); • Fine tuning catchment-scale water quality monitoring (Project 2.1.7); • Turning the tide in mangrove preservation (Project 2.3.4); • Hashtag citizen science: Using Big Data techniques to mine social media for reef condition (Project 2.3.2); • Good use for bad paddocks: Evaluating alternate land use to reduce Great Barrier Reef pollution (Project 2.1.2); • Less waste, less run-off: Reducing nitrogen overuse with enhanced effectiveness fertilizers (Project 2.1.8); • Damage greater than the sum of its parts: Understanding cumulative impact on the Great Barrier Reef (Project 2.1.6); • Stopping the shifting sands: Evaluating gully erosion remediation options (Project 2.1.4); • How to sell best management practices: Improving marketing of water quality practices (Project 2.1.3); • Stopping the shifting sands: Investigating major alluvial gully remediation (Project 2.1.10); • Light threshold indicators for GBR health (Project 2.3.1); • Tracking potential cross-border pollution from the Ok Tedi Mine in PNG (Project 2.2.2); • Snapping the stingers: Working with Indigenous rangers to protect swimmers from Irukandji (Project 2.2.3); • What are the effects of dredging? Closing knowledge gaps on a hot-button issue (Project 2.1.9); • What's in the water? Tracking Fly River plumes (Project 2.2.1); • How to defeat a horde of coral-eating monsters: Integrated pest management strategies for Crown-of-Thorns Starfish (Project 2.1.1); • Working with Traditional Owners in Cape York for improved water quality (Project 2.3.3);

	• Cane farmers and scientists working together for water quality monitoring (Project 2.1.7).
Media – Radio Interviews	The TWQ hub promoted the NESP research on **8** occasions: • Brazil media – State of the GBR (8 Mar 2016); • Media interview – Promote Run for the Reef and NESP TWQ Hub GBR projects (14 June 2016); • ABC radio interview – Coral bleaching (20 June 2016); • Channel 7 interview – Effects of coral bleaching and the health of the GBR (21 July 2016); • German media – Coral bleaching, COTS and GBR (31 Aug 2016); • Radio interview – State of the GBR (19 Sept 2016); • Television interview – Coral spawning (11 Oct 2016); • Media interview – Outcomes of the Reef Science Synthesis Workshop (15 Nov 2016).

Table B: Indigenous Engagement and Participation

Key Performance Indicator	Hub Result for 12-month Period (numerical only)	Explanation (if any)
1. The extent to which Indigenous engagement has contributed positively to NESP research activity;	**79**	- No. of partnerships - additional funding (11) - No. of Indigenous participants (59) - Number of projects where IE, TK contributed/enhanced enviro knowledge(5) - Number of projects where IE, TK contributed to development of enviro solutions (4) Examples include: Stan Lui has attended initial meetings (2.1.4) to explore options/opportunities for indigenous engagement) Project 25 Jaragun TO group 2.2.1 and 2.2.2 working closely with TSRA Rangers and LSMU to set up salinity monitoring 2.2.3 Gavin Singleton (Yirrganydji) Yirrganydji Indigenous Rangers have been trained in the deployment of cameras and net sampling of Irukandji for the next summer season. 2.3.5 TSRA, Cass Hunter CSIRO
2. The extent to which NESP supported Indigenous communities to work on, and care for, Country	**56**	- No. Indigenous corporations contracted to provide services/products & $value. (7) - No. & type Indigenous groups in NESP projects. (12) - No. & FTE Indigenous people employed full-time. (3) 2.2.3 Yirrganydji - 3 Indigenous Rangers - No. & FTE Indigenous people employed part-time. (34)
3. The extent to which Indigenous people have derived professional development and knowledge sharing from engagement and participation in NESP;	**42**	- No. of Indigenous researchers/grads/post-doc/Phd employed. (1) - Number of Indigenous people trained in enviro management tools & techniques. (41) For example: 2.1.5 – Contact has been made with Gudjuda Reference Group Aboriginal Corporation Traditional Owners of the Burdekin/Townsville region to discuss

Key Performance Indicator	Hub Result for 12-month Period (numerical only)	Explanation (if any)
		project results. Researchers plan to explore engagement opportunities through GBRMPA as well as possibly through the 'Deadly Science' initiative. - 2.2.1 It is estimated that 10-12 TSRA Rangers will be trained in salinity monitoring. - 2.2.2 Rangers received training in field sampling techniques - 2.2.3 Tish King has been offered an Indigenous Summer Research Fellowship from the Gumurrii Student Support Unit at GU to work on the project. (4) Gavin Singleton (Yirrganydji tribe) plus 3 Indigenous Rangers have been trained in the deployment of cameras and net sampling of Irukandji.
4. The extent to which NESP has delivered outcomes that supports Indigenous land and sea managers/owners to care for Country;	**54**	- No. &/or Ha of ILC lands benefit from NESP research & outcomes. (3) eg 2.1.7 Babinda Swamp Constructed Wetland Project. One of the selected catchment monitoring sites is located essentially at the inflow point to the Constructed Wetland. - 2.3.3 Kalan Enterprise Plan objectives - No. of management tools for Indigenous waters & land benefit from NESP research & outcomes. (4) - No. &/or Ha of Indigenous \owned/managed/joint managed lands benefit from NESP research. (47)
5. The extent to which hub Communication and Knowledge Brokering Strategy effectively address Indigenous knowledge sharing and communication needs;	**70**	- No. & type of communications products used to show research results to Indigenous people. (14) - No. of research, knowledge sharing, communications days held with Indigenous communities. (20) - eg Project 2.1.7 Several telephone-email conversations relating to water quality monitoring technologies and program linkages with ongoing TO landscape restoration programs in study area.

Key Performance Indicator	Hub Result for 12-month Period (numerical only)	Explanation (if any)
		- 2.3.3 Engagement with Kalan Enterprises staff in Coen and CYLC Chairman. Development of video products and information sheets, public events, conference presentations, joint papers with Indigenous people.(8) - Number of Hub participants in cultural awareness raising activities (formal training/ workshops).(28)
6. The extent to which understanding of Australia's environment has been improved through a collaborative approach that delivers accessible results and informs decisions; and	**100%**	- Percent of Indigenous owned or managed land accessed & applied NESP research.
7. The extent to which hubs and Indigenous communities have developed partnerships to undertake NESP research.	**7**	- Number of formal partnership agreements developed with Indigenous people/orgs. (6) - Number of NESP project Indigenous Reference Groups established.(1)

Section 8 – Accessibility of publications and other outputs

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
1.1	Westcott, D.A., Fletcher, C. S, Babcock, R., Plaganyi-Lloyd, E. (2016) *A Strategy to Link Research and Management of Crown-of-Thorns Starfish on the Great Barrier Reef: An Integrated Pest Management Approach*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (80pp.).	Yes	March 2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.1-FINAL-REPORT.pdf	Final Report
1.2	Bartley, R., Philip, S., Henderson, A.E. and Tindall, D., 2016. *Investing in riparian zone management to reduce erosion from stream channels: how do we evaluate success?* Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (54pp.).	Yes	April 2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.2-PART-A-FINAL-REPORT.pdf	Final Report Part A
1.2	Bartley, R., Goodwin, N., Henderson, A.E., Hawdon, A., Tindall, D., Wilkinson, S.N. and Baker, B., 2016. *A comparison of tools for monitoring and evaluating channel change*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (29pp.).	Yes	April 2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-1.2-PART-B-FINAL-REPORT.pdf	Final Report Part B
1.3	Lewis, S. E., Lough, J. M., Cantin, N., Matson, E. Kinsley, L. and Brodie, J. E. (2016) *An examination of the ability of coral geochemical records to reconstruct suspended sediment loads to the Great Barrier Reef lagoon*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (20pp.).	Yes	August 2016	http://nesptropical.edu.au/wp-content/uploads/2016/08/NESP-TWQ-1.3-FINAL-REPORT.pdf	Final Report
1.5	Greiner, R. (2015) *Ex-post evaluation of an environmental auction : Legacy of the 2008 Lower Burdekin Water Quality Tender*. Report to the National Environmental Science Program. Reef and Rainforest Research Centre Limited, Cairns (46pp.).	Yes	January 2016	http://nesptropical.edu.au/wp-content/uploads/2016/01/NESP-TWQ-1.5-FINAL-REPORT.pdf	Final Report
1.6	Uthicke, S., Fabricius, K., De'ath, G., Negri, A., Warne, M., Smith, R., Noonan, S., Johansson, C., Gorsuch, H. and Anthony, K. (2016) *Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management: Final Report Project 1.6*. Report to the National Environmental Science	Yes	April 2016	http://nesptropical.edu.au/wp-content/uploads/2016/08/NESP-TWQ-1.6-FINAL-REPORTA.pdf	Final Report

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
	Programme. Reef and Rainforest Research Centre Limited, Cairns (144pp.).				
1.6	Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for management	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-Project-1.6-Factsheet-Outcomes.pdf	Outcomes Factsheet
1.7	Brooks, A., Spencer, J., Curwen, G, Shellberg, J., Garzon-Garcia, A, Burton, J. & Iwashita, F. (2016) *Reducing sediment sources to the Reef: Managing alluvial gully erosion*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (375pp.).	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-1.7-FINAL-REPORT-COMPLETE-10-06-16.pdf	Final Report
1.8	Davis, A.M., Waterhouse, J. (2016). *Sub-catchment scale monitoring, modelling and extension design to support reef water quality improvement in sugarcane catchments*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (114pp.).	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-1.8-FINAL-REPORT-A.pdf	Final Report
1.9	Schaffelke, B., Brinkman, R., Dobbs, K., Jones, R., Kane, K., Negri, A., Rasheed, M. (2016) *The establishment of a future NESP dredging research investment framework: NESP TWQ Hub Project 1.9*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (22pp.).	Yes	January 2016	http://nesptropical.edu.au/wp-content/uploads/2016/02/NESP-TWQ-1.9-FINAL-REPORT.pdf	Final Report
1.10	Kroon, F.J., Berry, K.L.E., Brinkman, D.L., Davis, A., King, O., Kookana, R., Lewis, S., Leusch, F., Makarynskyy, O., Melvin, S., Müller, J., Neale, P., Negri, A., O'Brien, D., Puotinen, M., Smith, R., Tsang, J., van de Merwe, J., Warne, M., Williams, M. (2015). *Identification, impacts, and prioritisation of emerging contaminants present in the GBR and Torres Strait marine environments*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (138pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-1.10-FINAL-REPORTa.pdf	Final Report
2.1	Williamson, D.H., Ceccarelli, D. M., Rossetti, G., Russ, G. R. and Jones, G. P. (2016) *Assessing the cumulative impacts of climatic disturbances on coral reefs in the Keppel Islands, Great Barrier Reef Marine Park*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (65pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-2.1-FINAL-REPORT.pdf	Final Report

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
2.2	Smart, J. B., Hasan, S., Volders, A., Curwen, G., Fleming, C. and Burford, M. (2016) *A tradable permit scheme for cost-effective reduction of nitrogen runoff in the sugarcane catchments of the Great Barrier Reef*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (75pp.).	Yes	March 2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-2.2-FINAL-REPORT.pdf	Final Report
3.1	Carter, A. B., McKenna, S. A., Rasheed, M. A., McKenzie L, Coles R. G. (2016) *Seagrass mapping synthesis: A resource for coastal management in the Great Barrier Reef World Heritage Area*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (22pp.).	Yes	February 2016	http://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.1-FINAL-REPORT.pdf	Final Report
3.2	Cleguer, C., Preston, S., Hagihara, R., Shimada, T., Udyawer, V., Hamann, M., Simpson, S., Loban, F., Bowie, G., Fujii, R., and Marsh, H. (2016) *Working with the community to understand use of space by dugongs and green turtles in Torres Strait: A project in collaboration with the Mura Badulgal Registered Native Title Bodies Corporate*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (62pp.).	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.2-FINAL-REPORT-1.pdf	Final Report
3.2	Hagihara, R., Cleguer, C., Preston, S., Sobtzick, S., Hamann, M., Shimada, T. and Marsh, H. (2016) *Improving the estimates of abundance of dugongs and large immature and adult-sized green turtles in Western and Central Torres Strait*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (53pp.).	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.2-FINAL-REPORT-2.pdf	Final Report
3.3	Collier, C.J., Chartrand, K., Honchin, C., Fletcher, A. Rasheed, M. (2016). *Light thresholds for seagrasses of the GBR: a synthesis and guiding document. Including knowledge gaps and future priorities*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (41pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.3-FINAL-REPORTa.pdf	Final Report
3.4	Collier, C.J., Langlois, L. Zemoi, R.,Martin, K., McKenzie, L. (2016) *Developing and refining biological indicators for condition assessments in an integrated monitoring program*. Report to the National Environmental Science Programme.	Yes	March 2016	http://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.4-FINAL-REPORT.pdf	Final Report

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
	Reef and Rainforest Research Centre Limited, Cairns (31pp.).				
3.5	Carter, A. B., Rasheed, M. A. (2016) *Assessment of Key Dugong and Turtle Seagrass Resources in North-west Torres Strait*. Report to the National Environmental Science Programme and Torres Strait Regional Authority. Reef and Rainforest Research Centre Limited, Cairns (41pp.).	Yes	April 2016	http://nesptropical.edu.au/wp-content/uploads/2016/04/NESP-TWQ-3.5-FINAL-REPORT.pdf	Final Report
3.6	Kingsford, M.J., Pitt, K., Llewellyn, L., O'Callaghan, M.D., Seymour, J., Richardson, A. (2016) *Project 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*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (42pp.).	Yes	March 2016	http://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.6-FINAL-REPORT.pdf	Final Report
3.7	Sweatman, H., Cheal, A., Emslie, M., Johns, K., Jonker M., Miller, I., Osborne, K. (2015) *Effects of marine park zoning on coral reefs of the Capricorn-Bunker Group – Report on surveys in October 2015*. Report to the National Environmental Science Program. Reef and Rainforest Research Centre Limited, Cairns (15pp.).	Yes	December 2015	http://nesptropical.edu.au/wp-content/uploads/2015/12/NESP-TWQ-3.7-FINAL-REPORT.pdf	Final Report
3.8	Addison, P., Walshe, T., Sweatman, H., Jonker, M., MacNeil, A., Thompson, A., Logan, M. (2015) *Towards an integrated monitoring program: Identifying indicators and existing monitoring programs to effectively evaluate the Long Term Sustainability Plan*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (118pp.).	Yes	December 2015	http://nesptropical.edu.au/wp-content/uploads/2016/01/NESP-TWQ-3.8-FINAL-REPORT.pdf	Final Report
3.9	Dale, A., George, M., Hill, R. and Fraser, D. (2016) *Traditional Owners and Sea Country in the Southern Great Barrier Reef – Which Way Forward?* Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (50pp.).	Yes	April 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.9-FINAL-REPORT.pdf	Final Report
3.9	Indigenous capacity building and increased participation in sea country management: Project Results	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/06/NESP-TWQ-3.9-Factsheet-Outcomes.pdf	Outcome Facsheet
3.9	Indigenous capacity building and increased participation in management of Queensland sea country	Yes	December 2015	http://nesptropical.edu.au/wp-content/uploads/2015/12/NESP-Project-3.9-Factsheet.pdf	Factsheet

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
3.10	Rolfe, J., Windle, J. (2016) *Benchmarking costs of improving agricultural water management in GBR catchments*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (52pp.).	Yes	March 2016	http://nesptropical.edu.au/wp-content/uploads/2016/03/NESP-TWQ-3.10-FINAL-REPORT.pdf	Final Report
3.11	Dale, A.P., Vella, K., Pressey, R.L., Brodie, J., Gooch, M., Potts, R. and Eberhard, R. (2016). *Monitoring and adaptively reducing system-wide governance risks facing the GBR: Final report*. Reef and Rainforest Research Centre Limited, Cairns (20pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.11-FINAL-REPORT.pdf	Final Report
3.12	Maron, M., Walsh, M., Shumway, N. and Brodie, J. (2016) *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)*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (74pp.).	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-3.12-FINAL-REPORTa.pdf	Final Report
3.13	Lawrey, E. P. and Stewart, M. (2016) *Mapping the Torres Strait Reef and Island Features: Extending the GBR Features (GBRMPA) dataset*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (103pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.13-FINAL-REPORT-1.pdf	Final Report
3.13	Lafond, G. and Lawrey, E. (2016) *Highlights of the National Environmental Research Program Tropical Ecosystems (NERP TE) Hub datasets: eAtlas Metadata Catalogue 2011-2014*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (47pp.).	Yes	May 2016	http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.13-FINAL-REPORT-2.pdf	Final Report
2.1.1	Fletcher, C.S. and Westcott, D.A. (2016) *Strategies for Surveillance and Control: Using Crown-of-Thorns Starfish management program data to optimally distribute management resources between surveillance and control*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (22pp.).	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-2.1.1-FINAL-REPORT-1.pdf	Final Report

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
2.1.1	Integrated Pest Management of Crown-of-Thorns Starfish	Yes	October 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.1-Factsheet.pdf	Factsheet
2.1.2	Scoping options for low lying, marginal cane land to reduce DIN in priority wet tropics catchments	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.2-Factsheet.pdf	Factsheet
2.1.3	Eagle, L., Hay, R., Farr, M. (2016) *Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: Background review of literature*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (98pp.).	Yes	December 2016	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.1.3-INTERIM-REPORT-1.pdf	Interim Report
2.1.3	Hay, R., and Eagle, L., (2016) *Harnessing the science of social marketing and behaviour change for improved water quality in the Great Barrier Reef: A documentary analysis of Reef Trust Tender (Burdekin) and Reef Programme*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (95pp.).	Yes	December 2016	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.1.3-INTERIM-REPORT-2.pdf	Interim Report
2.1.3	Harnessing the science of social marketing and behaviour change for improved water quality in the GBR: an action research project	Yes	December 2016	http://nesptropical.edu.au/wp-content/uploads/2016/12/NESP-TWQ-Project-2.1.3-Factsheetb.pdf	Factsheet
2.1.4	Demonstration and evaluation of gully remediation on downstream water quality and agricultural production in GBR rangelands	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.4-Factsheet.pdf	Factsheet
2.1.5	What's really damaging the Reef? Tracing the origin and fate of the environmentally detrimental sediment	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.5-Factsheet.pdf	Factsheet
2.1.6	Humanes, A., Noonan, S.H.C., Willis, B.L., Fabricius, K.E., Negri, A.P. (2016) *Cumulative Effects of Nutrient Enrichment and Elevated Temperature Compromise the Early Life History Stages of the Coral Acropora tenuis*. **PLoS ONE** 11(8): e0161616. doi:10.1371/journal.pone.0161616	Yes	August 2016	http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161616	Journal Article
2.1.6	Adams, M.P., Collier, C.J., Uthicke, S., Ow, Y.X., Langlois, L., O'Brien, K.R. (2016) *Model fit versus biological relevance: Evaluating photosynthesis-temperature models for three tropical seagrass species*. **Scientific Reports** 2017/01/04. doi:10.1038/srep39930	Yes	January 2017	http://www.nature.com/articles/srep39930	Journal Article

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
2.1.6	From exposure to risk: novel experimental approaches to analyse cumulative impacts and determine thresholds in the GBRWHA	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.6-Factsheet.pdf	Factsheet
2.1.7	Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.7-Factsheet.pdf	Factsheet
2.1.7	Project 25: Scientists and Farmers working together for the future of Great Barrier Reef Water Qual (Project 2.1.7)	Yes	August 2016	https://www.youtube.com/watch?time_continue=1&v=cuslOI8RD9o	Video
2.1.8	Improved Water Quality Outcomes from On-Farm Nitrogen Management	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.1.8-Factsheet.pdf	Factsheet
2.1.9	Risk assessing dredging activities	Yes	October 2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.1.9-Factsheet.pdf	Factsheet
2.1.10	Brooks, A., Pietsch, T., Thwaites, R., Loch, R., Pringle, H., Eccles, S., Baumgartl, T., Biala, J., Spencer, J., Zund, P., Spedding., T., Heap A., Burrows., D., Andrewartha, R., Freeman., A., Lacey, S., Higham., W., Goddard., M., (2016) *Communique: Alluvial Gully Systems Erosion Control & Rehabilitation Workshop, Collinsville 8-10 August 2016*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (23pp.)	Yes	October 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/Project-2-1-10-COMMUNIQUE-Collinsville-Alluvial-Gully-Workshop-COMPLETE.pdf	Communique
2.1.10	The application and adaption of mine site rehabilitation approaches to alluvial gully rehabilitation in the Bowen Catchment	Yes	October 2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.1.10-Factsheet.pdf	Factsheet
2.2.1	Lough, J. M. (2016) *Coral Core Records of the North-east Torres Strait*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (24pp.).	Yes	January 2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.2.1-INTERIM-REPORT-1.pdf	Interim Report
2.2.1	Impacts of Fly River pollution on Torres Strait environments and communities	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.2.1-2.2.2-Factsheet.pdf	Factsheet
2.2.2	Impacts of Fly River pollution on Torres Strait environments and communities	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.2.1-2.2.2-Factsheet.pdf	Factsheet
2.2.3	Early warning systems to minimise the risk of box jellyfish stings by empowering stakeholders	Yes	October 2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.2.3-Factsheet.pdf	Factsheet

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
2.3.1	Benthic light as ecologically-validated GBR-wide indicator for water quality: drivers, thresholds and cumulative risks	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.1-Factsheet.pdf	Factsheet
2.3.2	'Human sensors' for monitoring Great Barrier Reef environmental changes and quality of marine waters through harnessing Big Data analysis	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.2-Factsheet.pdf	Factsheet
2.3.3	Barber, M., Dale, M., Pearse, R., Everson, B., Perry, J., Jaffer, T., Winer, M., Creek, D. (2016) *Scoping market-based opportunities for Indigenous provision of water quality services and associated conservation governance in the Northern Great Barrier Reef: Interim Project Report and Discussion Paper*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (51pp.).	Yes	January 2017	http://nesptropical.edu.au/wp-content/uploads/2017/01/NESP-TWQ-2.3.3-INTERIM-REPORT-1a.pdf	Interim Report
2.3.3	Building Indigenous livelihood and co-management opportunities in the northern Great Barrier Reef – ecosystem services and conservation governance for water quality	Yes	September 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.3-Factsheet-Stakeholder.pdf	Factsheet
2.3.4	Duke, N.C. and MacKenzie, J. (2016) *Southern GBR Coastal Habitat Archive and Monitoring Program (S-GBR CHAMP): Progress Report June 2016*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (41pp.).	Yes	June 2016	http://nesptropical.edu.au/wp-content/uploads/2016/07/NESP-TWQ-2.3.4-PROGRESS-REPORT-1.pdf	Progress Report
2.3.4	Mackenzie, J.R., Duke, N.C., Wool, A.L. (2016) *The Shoreline Video Assessment Method (S-VAM): Using dynamic hyperlapse image acquisition to evaluate shoreline mangrove forest structure, values, degradation and threats*. **Marine Pollution Bulletin**, Vol. 109, Issue 2, August 2016, pages 751-763. doi:10.1016/j.marpolbul.2016.05.069	Yes	August 2016	http://www.sciencedirect.com/science/article/pii/S0025326X16303903	Journal Article
2.3.4	Duke, N.C. (2016) Oil spill impacts on mangroves: *Recommendations for operational planning and action based on a global review*. **Marine Pollution Bulletin**, Vol. 109, Issue 2, August 2016, pages 700.715. doi:10.1016/j.marpolbul.2016.06.082	Yes	August 2016	http://www.sciencedirect.com/science/article/pii/S0025326X16304866	Journal Article

Project No.	Output	Published? Yes/No	Date of Publication	Where Published (link)	Comments
2.3.4	Rogers, K., Boon, P.I., Branigan, S., Field, C.D., Duke, N.C., Fitzsimons, J.A., Kirkman, H., Mackenzie, J.R., Saintilan, N. (2016) *The state of legislation and policy protecting Australia's mangrove and salt marsh and their ecosystem services*. **Marine Policy**, Vol. 72, October 2016, pages 139-155. doi:10.1016//j.marpol.2016.06.025	Yes	October 2016	http://www.sciencedirect.com/science/article/pii/S0308597X16304067	Journal Article
2.3.5	eAtlas – Data management for environmental research	Yes	July 2016	http://nesptropical.edu.au/wp-content/uploads/2016/10/NESP-TWQ-Project-2.3.5-Factsheet.pdf	Factsheet
2.3.4	Working with Traditional Owners and local citizens to better manage GBR estuarine wetlands	Yes	November 2016	http://nesptropical.edu.au/wp-content/uploads/2016/11/NESP-TWQ-Project-2.3.4-Factsheet.pdf	Factsheet

Section 9. Key changes (if any) to Research Plan to better meet the needs of end-users and respond to emerging needs

<table>
<tr><th>Date</th><th>Project</th><th>Updates to Research Plan V2</th><th>Reason for Update</th></tr>
<tr><td>22 Jan 2016</td><td>2.1.10 (Brooks, GU)</td><td>Project included into approved RP2</td><td>Minister's request for the project.</td></tr>
<tr><td>23 Feb 2016</td><td>2.3.2 (Becken, GU)</td><td>Replaced Prof Michael Blumenstein (GU) with Prof Rod Connolly (GU). FTE of 0.05 remains the same.</td><td>Prof Michael Blumenstein has moved to a different university.</td></tr>
<tr><td>21 Mar 2016</td><td>2.1.1 (Westcott, CSIRO)</td><td>Babcock (was 0.15); Plaganyi (was 0.46)
<table>
<tr><td>Dr Russ Babcock</td><td>Co-Investigator</td><td>CSIRO</td><td>russ.babcock@csiro.au</td><td>0.12</td></tr>
<tr><td>Dr Eva Plaganyi</td><td>Co-Investigator</td><td>CSIRO</td><td>eva.plaganyi-lloyd@csiro.au</td><td>0.31</td></tr>
</table></td><td>Change to FTE for team members as advised by CSIRO</td></tr>
<tr><td>21 Mar 2016</td><td>2.1.4 (Bartley, CSIRO)</td><td>1. Change to wording of number of telemetered water samplers to be installed. (p. 43) Capital expenditure will include:
A minimum of four automated and telemetered water quality samplers (for remote sample collection during events) @ ~ $35k per site
2. Increased in-kind from CSIRO (was $699,163) now $699,694
Project Budget - Funding and Partnerships
<table>
<tr><th>Contributing Organisation</th><th>Cash</th><th>In-Kind</th><th>Total</th></tr>
<tr><td>NESP</td><td>600,000</td><td>-</td><td>600,000</td></tr>
<tr><td>CSIRO</td><td>-</td><td>699,694</td><td>699,694</td></tr>
<tr><td>NQ Dry Tropics</td><td>-</td><td>20,000</td><td>20,000</td></tr>
<tr><td>QEHP</td><td>65,000-</td><td></td><td>65,000</td></tr>
<tr><td>QDAF</td><td>-</td><td>20,000</td><td>20,000</td></tr>
<tr><td>QDSITI</td><td>-</td><td>20,000</td><td>20,000</td></tr>
<tr><td>Total</td><td>$ 665,000</td><td>$ 759,694</td><td>$ 1,424,694</td></tr>
</table>
Project Budget – CSIRO
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In-Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>436,000</td><td>574,694</td><td>1,010,694</td></tr>
</table></td><td>"Hopefully we will be able to install more than 4 sites, however, the $ exchange rate is affecting us at the moment as most of the equipment is imported".

In-kind budget increase as notified by CSIRO</td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>144,000</td><td>125,000</td><td>269,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>$ 580,000</td><td>$ 699,694</td><td>$ 1,279,691</td></tr>
</table>

3. Change to Dec 2016 milestone. LiDAR has been replaced with TLS.
<table>
<tr><td>4. Report on installation and collection of ‘before’ data (according to a BACI design) and undertake Terrestrial Laser Scanner approach [CSIRO]
5. Report on progress of Indigenous engagement. [CSIRO]
6. Discuss project data management and data products with the eAtlas team. See http://eatlas.org.au/resources/nesp-submissions [CSIRO]</td><td>1 December 2016</td><td>97,500</td><td>2,500</td></tr>
</table>

4. Andrea Leverington (Office of GBR) removed from end-users
</td>
<td>As advised by the Hub Leader, TLS must replace LiDAR.

As advised by the Project Leader, Leverington has left the Office of the GBR</td>
</tr>
<tr>
<td>21 Mar 2016</td>
<td>Project 2.2.2 (Apte, CSIRO)</td>
<td>Chariton (was 0.06); Ellis (was 0.03)
<table>
<tr><td>*Dr Anthony Chariton</td><td>Research Scientist</td><td>CSIRO</td><td>Anthony.Chariton@csiro.au</td><td>0.07</td></tr>
<tr><td>*Dr Nick Ellis</td><td>Research Statistician</td><td>CSIRO</td><td>Nick.Ellis@csiro.au</td><td>0.04</td></tr>
</table>
</td>
<td>Change to FTE for team members as advised by CSIRO</td>
</tr>
<tr>
<td>21 Mar 2016</td>
<td>Project 2.2.3 (Richardson, CSIRO)</td>
<td>1. Changes to FTE of Richardson (was 0.2); Condie (was 0.05); Davies (was 0.15); Gershwin (was 0.1)
<table>
<tr><td>Assoc. Prof. A.J. Richardson*</td><td>Principal Investigator</td><td>CSIRO/UQ</td><td>anthony.richardson@csiro.au</td><td>0.49</td></tr>
</table>
</td>
<td>Change to FTE for team members as advised by CSIRO</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>Prof. M. Kingsford</td><td>Co-Investigator</td><td>JCU</td><td>michael.kingsford@jcu.edu.au</td><td>0.1</td></tr>
<tr><td>Dr S. Condie*</td><td>Co-Investigator</td><td>CSIRO</td><td>scott.condie@csiro.au</td><td>0.16</td></tr>
<tr><td>Dr K. Pitt</td><td>Co-Investigator</td><td>Griffith</td><td>k.pitt@griffith.edu.au</td><td>0.1</td></tr>
<tr><td>M. O'Callaghan*</td><td>Technical assistant</td><td>JCU</td><td>mark.ocallaghan@jcu.edu.au</td><td>0.1</td></tr>
<tr><td>C. Davies*</td><td>Database</td><td>CSIRO</td><td>Claire.davies@csiro.au</td><td>0.3</td></tr>
<tr><td>Dr L. Gershwin*</td><td>Image Analysis</td><td>CSIRO</td><td>lisa.gershwin@csiro.au</td><td>0.46</td></tr>
</table>

2. Adjustments to CSIRO budget tables - Operating (was $15,000 NESP; $15,000 in-kind); Salaries(was $185,000 NESP; $185,000 in-kind)

Project Budget – CSIRO
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In-Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>190,968</td><td>190,968</td><td>381,936</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>9,032</td><td>9,032</td><td>18,064</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>$ 200,000</td><td>$ 200,000</td><td>$ 400,000</td></tr>
</table>
</td>
<td>As advised by CSIRO.</td>
</tr>
<tr>
<td>22 Mar 2016</td>
<td>Project 2.2.1 (Waterhouse, JCU)</td>
<td>Johanna Johnson changed institution from JCU to C_2O Consulting.

C_2O Consulting added into milestone table for tasks in 1 June 2016, 1 December 2016, 1 June 2017, 10 December 2017.

Changes to Budget Table - C_2O Consulting ($20,000 NESP; $26,000 In-kind) – sub-contract to JCU.
** The amount disbursed to James Cook University is $276,000. Of this, $223,000 is allocated to James Cook University. The remaining $20,000 will be sub-contracted and re-disbursed by James Cook University to C_2O Consulting in accordance with the Research Plan v2.</td>
<td>As advised by the Project Leader. C_2O Consulting will be sub-contracted and paid $20,000 NESP cash and contribute $26,000 in-kind.

Contributions to milestone tasks now include C_2O Consulting.</td>
</tr>
<tr>
<td>14 Mar 2016</td>
<td>Project 2.3.2 (Becken, GU)</td>
<td>Additional PhD students in the project team (Ren, 0.4; Sullivan, 0.2)
Franciscus changed FTE from 1.0 to 0.4.

<table>
<tr><td>Nigel Franciscus</td><td>PhD Student</td><td>Griffith University</td><td>Nigel.franciscus@griffith.edu.au</td><td>0.4</td></tr>
<tr><td>Xuguang Ren</td><td>PhD Student</td><td>Griffith</td><td>xuguang.ren@griffithuni.edu.au</td><td>0.4</td></tr>
</table>
</td>
<td>Griffith University PhD scholarship top-up program enabled 2 additional students to join the project.</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>University</td><td></td><td></td></tr>
<tr><td>Tommi Sullivan</td><td>PhD Student</td><td>Griffith University</td><td>t.sullivan@griffithuni.edu.au</td><td>0.2</td></tr>
</table>
</td><td></td></tr>
<tr><td>4 May 2016</td><td>Project 2.1.8 (Bell, UQ)</td><td>Revised Indigenous Engagement Category 2 to a Category 3.</td><td>All trials for the project will be associated with existing local grower groups to maximize extension of results.</td></tr>
<tr><td>9 June 2016</td><td>Project 2.3.1 (Fabricius, AIMS)</td><td>Change to project team. Dr Scarla Weeks, UQ (FTE 0.1) replaced by Ms Marites Canto, AIMS (FTE 1.0). All UQ funding will be provided to AIMS for the life of the project.</td><td>Dr Scarla Weeks no longer able to participate in project due to health reasons.</td></tr>
<tr><td>13 June 2016</td><td>All projects</td><td>Updated DOE & GBRMPA end users and key stakeholders.</td><td>As advised by the DOE Hub Liaison Officer</td></tr>
<tr><td>14 June 2016</td><td>Project 2.1.9 (Jones, AIMS)</td><td>1 June 2016 Milestone joined with 1 December 2016. 1 December 2016 milestone will include both the 1 June & 1 December 2016 milestone payments.</td><td>Project commenced 1 June 2016.</td></tr>
<tr><td>10 July 2016</td><td>Project 2.2.1 (Waterhouse, JCU)</td><td>Updated names and email addresses of hydrodynamic modeller (Yanfang Li) & metals design and analysis (Simone Birrer) in project team.</td><td>As advised by project leader.</td></tr>
<tr><td>13 July 2016</td><td>Project 2.2.3 (Richardson, CSIRO)</td><td>Movement of $20,000 NESP Cash from salaries to operating

Original Budget – Griffith University
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>20,000</td><td>20,000</td><td>40,000</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>5,000</td><td>5,000</td><td>10,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>$25,000</td><td>$25,000</td><td>$50,000</td></tr>
</table>
Revised Budget – Griffith University
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>0</td><td>20,000</td><td>40,000</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>25,000</td><td>5,000</td><td>10,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>$25,000</td><td>$25,000</td><td>$50,000</td></tr>
</table>
</td><td>Requested by AP Kylie Pitt, project team co-investigator:
I am writing to request a change to the way funds are distributed between the 'Salaries' and 'Operating' component of the budget allocated to Griffith University for NESP Project 2.2.3 'Early warning systems to minimise the risk of box jellyfish stings by empowering stakeholders'.
I would like to request this change because I have managed to recruit an honours student and a visiting research fellow from the Chinese Academy of Sciences, who will be at Griffith until March 2017, to work on the project. A student has also recently applied for a scholarship to undertake a PhD under my supervision. If successful, the PhD student would also work on the NESP project (note that the student is ranked very highly and so it is likely she will be offered a scholarship). Because I have recruited students and a visiting research fellow to work on the project, we do not require funding for salaries. By redirecting the funds allocated to salaries to operating costs we will be able to greatly increase the number of experiments we will be able to undertake and this will represent much greater value-for-money for the project.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>APPROVED by Hub Leader, 22 May 2016</td></tr>
<tr><td>12 Aug 2016</td><td>Project 2.1.1 (Westcott, CSIRO)</td><td>Added Steve Moon (Projects Global) and Operations Manager for the COTS control program as a stakeholder/ end-user to the project.</td><td>Steve Moon (Projects Global) is the Operations Manager for the COTS control program.</td></tr>
<tr><td>23 Aug 2016</td><td>Project 2.2.2 (Apte, CSIRO)</td><td>Updated end-users table to include Ewan Gunn (TSIRC) and Diana Russell (TSC); deleted Qld Health as an end-user as the project will not be making recommendations for human health.

Dave Brewer (0.12 FTE) and Tim Skewes (0.12 FTE) have been replaced with Dr Nicole Murphy, CSIRO (FTE 0.24).</td><td>As advised by the project leader and as per CSIRO ethics requirements for human health.

Dave Brewer & Tim Skewes made redundant from CSIRO.</td></tr>
<tr><td>24 Aug 2016</td><td>Project 2.1.7 (Davis, JCU)</td><td>Jack Robertson, DAF added to project team (0.4 FTE).
Carla Wegscheidl, DAF added to project team (0.1 FTE)
Leith Boully, TWQ Hub added to project team (0.03 FTE)
Sheriden Morris, RRRC added to project team (0.05 FTE)
Boyd Robertson, RRRC added to project team (0.05 FTE)

Phil Hales, DAF added to Research End Users and Stakeholders.

Project Milestones table updated to include RRRC.
<u>Project Milestones</u>
<table>
<tr><th>Milestones</th><th>Due Date</th><th>NESP Payment JCU</th><th>NESP Payment RRRC*</th></tr>
<tr><td>Signing of Contract</td><td>On signing</td><td>$40,000</td><td>$10,000</td></tr>
<tr><td>1. Report on:
a) Establishment of technical and stakeholder-based project steering committee [JCU]
b) Development of scientific and citizen science monitoring plan with steering committee and engaged growers [JCU]
2. Report on progress of Indigenous engagement – Category 2 project – see Indigenous engagement expectations below. [JCU]
3. Submit photos highlighting project activities along with their descriptions to the eAtlas and RRRC. See http://eatlas.org.au/resources/nesp-</td><td>1 June 2016</td><td>$40,000</td><td>$10,000</td></tr>
</table></td><td>As advised by the project leader, on-ground technical and extension support will be provided by DAF. RRRC will sub-contract DAF for on-ground technical and extension support.

Approved by Hub Administrator, Sheriden Morris, RRRC.</td></tr>
</table>

		submissions [JCU]					
		4. Report on: a) Progress of site selection and industry engagement and extension program [JCU] b) Communication and engagement activities with landholders and other stakeholders [JCU] 5. Report on progress of Indigenous engagement [JCU] 6. Discuss project data management and data products with the eAtlas team. See http://eatlas.org.au/resources/nesp-submissions [JCU]	1 December 2016	$80,000	$20,000		
		7. Report on: a) 1st year catchment monitoring (2016/17 wet season summary) [JCU] b) Communication and engagement activities with landholders and other stakeholders [JCU] 8. Report on progress of Indigenous engagement [JCU] 9. Submit additional photos highlighting project activities along with their descriptions to the eAtlas and RRRC. See http://eatlas.org.au/resources/nesp-submissions [JCU]	1 June 2017	$75,000	$25,000		
		10. Report on: a) Results from Year 2 field and extension program [JCU] b) Communication and engagement activities with landholders and other stakeholders [JCU] 11. Report on progress of Indigenous engagement [JCU]	1 December 2017	$75,000	$25,000		

		12. Submit a data management plan to the eAtlas outlining the expected datasets to be delivered by this project. See http://eatlas.org.au/resources/nesp-submissions [JCU]					
		13. Report on: a) 2nd year catchment monitoring (2017/18 wet season summary) [JCU] b) Communication and engagement activities with landholders and other stakeholders [JCU] 14. Report on progress of Indigenous engagement [JCU] 15. Submit completed datasets and associated documentation for publication in the eAtlas. Submissions must meet eAtlas publication standards. See http://eatlas.org.au/resources/nesp-submissions [JCU]	1 June 2018	$75,000	$25,000		
		16. Submit Final Report detailing: a) The 'Hotspot' identification process and results in GBR sugarcane catchment of the Russel/Mulgrave with targeted cane farmer interaction activities (related to sub-catchment and localized monitoring activities), focusing on emerging monitoring technologies (real-time water quality monitoring) to link farmer activities and improvements in practices with feedback from sub-catchment water quality measurements [JCU] 17. Report on communication activities with landholders and Traditional Owners [JCU] 18. Submit all project created datasets and associated documentation for publication in the eAtlas.	10 December 2018	$75,000	$25,000		

Submissions must meet eAtlas publication standards. See http://eatlas.org.au/resources/nesp-submissions [JCU]				
Total NESP Funding	**$600,000**	**$460,000**	**$140,000**

**The amount disbursed to RRRC is $140,000. Of this, $40,000 is allocated to RRRC. The remaining $100,000 will be sub-contracted and re-disbursed by RRRC to DAF in accordance with Research Plan v2.1.*

Amendment to Project Budget – Funding and Partnerships. DAF in-kind increased to $231,000. RRRC in-kind included $20,000.

Project Budget - *Funding and Partnerships*

Contributing Organisation	Cash	In-kind	Total
NESP	600,000	-	600,000
James Cook University	-	479,500	479,500
Department of Environment and Heritage Protection	22,500	82,000	104,500
Dept Agriculture & Fisheries	-	231,000	231,000
Dept of Science Information Technology and Innovation	-	21,500	21,500
RRRC	-	20,000	20,000
Total	**$622,500**	**$834,000**	**$1,456,500**

Amendment to Project Budget – Department of Agriculture and Fisheries to include In Kind contribution of $231,000.

Project Budget – Department of Agriculture and Fisheries

Item	NESP Cash	In Kind	Total Cost
Salaries	-	231,000	40,000
Operating (inc. equipment, travel & communications)	-	-	-
Administration Support	-	-	-
Total	**-**	**$231,000**	**$271,000**

Amendment to Project Budget – To be determined on-ground technical and extension support (Wet Tropics) NOW Reef and Rainforest Research Centre

<table>
<tr><td></td><td></td><td>Project Budget – Reef and Rainforest Research Centre
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>100,000</td><td>20,000</td><td>120,000</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>40,000</td><td>-</td><td>40,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>$140,000</td><td>$20,000</td><td>$160,000</td></tr>
</table></td><td></td></tr>
<tr><td>14 Sept 2016</td><td>Project 2.1.9 (Ross Jones, AIMS)</td><td>Added Chris Boland, Ports North to end users table</td><td>As requested by Chris Boland, CEO, Ports North.</td></tr>
<tr><td>26 Sept 2016</td><td>2.1.3 (Stoeckl/ Eagle)</td><td>Change of Project Leader from Natalie Stoeckl to Lynne Eagle (0.2 FTE).
Removal of Natalie Stoeckl from the project team.</td><td>Natalie Stoeckl on long leave period effective immediately from Sept 2016.</td></tr>
<tr><td>5 Oct 2016</td><td>2.2.3 (Richardson)</td><td>Change of Project Leader from Anthony Richardson (0.2 FTE) to Scott Condie (0.1 FTE)
Anthony Richardson – change of FTE (now 0.1 was 0.2)
Scott Condie – change of FTE (now 0.1 was 0.05)
Lisa Gershwin – change of FTE (now 0.2 was 0.1)
Change of project team member C. Davies now L. Thomas (no change to FTE)</td><td>Advised by Project Leader</td></tr>
<tr><td>14 Oct 2016</td><td>2.3.2 (Becken)</td><td>Added Fiona McQueenie, GBR Communications, DoEE to end users.</td><td>As advised by Damian Wrigley, Hub Liaison Officer.</td></tr>
<tr><td>4 Nov 2016</td><td>2.1.3 (Eagle)</td><td>Added Trish Lavery, DoEE Design and Analytics, Policy Analysis and implementation Division to stakeholders.</td><td>As requested by Trish Lavery.</td></tr>
<tr><td>18 Nov 2016</td><td>2.1.5 (Lewis)</td><td>Change to JCU Budget Table - Transfer of $23,000 operating funds to salaries

Project Budget - James Cook University (revised)
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>396,000</td><td>484,900</td><td>880,900</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>169,000</td><td>-</td><td>169,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>130,500</td><td>130,500</td></tr>
<tr><td>Total</td><td>$565,000</td><td>$615,400</td><td>$1,180,400</td></tr>
</table>
Project Budget - James Cook University (original)</td><td>The project leader has requested a transfer of $23,000 from operating to salaries to cover the cost of divers for instrument changeover. Under JCU policy, 3 divers must be on each vessel trip and there have been difficulties in obtaining volunteer divers, thus some wages will be made as an incentive to divers to ensure the instrument changeovers can occur as needed.

Approved by the Hub Leader 18 Nov 2016.</td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries</td><td>373,000</td><td>484,900</td><td>857,900</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>192,000</td><td>-</td><td>192,000</td></tr>
<tr><td>Administration Support</td><td>-</td><td>130,500</td><td>130,500</td></tr>
<tr><td>Total</td><td>$565,000</td><td>$615,400</td><td>$1,180,400</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>18 Nov 2016</td>
<td>Project 3.1.7 (Brooks)</td>
<td>
DSITI in-kind has been confirmed. This has been reduced from $514,170 to $100,990.

Project Budget – DSITI (revised)
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries (Zund 0.3 FTE)</td><td>-</td><td>100,990</td><td>100,990</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>-</td><td>$100,990</td><td>$100,990</td></tr>
</table>
Project Budget – DSITI (original)
<table>
<tr><th>Item</th><th>NESP Cash</th><th>In Kind</th><th>Total Cost</th></tr>
<tr><td>Salaries* (Zund 0.3; Burton 0.5, Garzon-Garcia 0.5)</td><td>-</td><td>486,970</td><td>486,970</td></tr>
<tr><td>Operating (inc. equipment, travel & communications)</td><td>-</td><td>27,200</td><td>27,200</td></tr>
<tr><td>Administration Support</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>-</td><td>$514,170</td><td>$514,170</td></tr>
</table>
*subject to approval
</td>
<td>DSITI has confirmed that they will have a parallel project is being developed by Alex Garcon-Garcia, Jo Burton and others from DSITI that will investigate the extent to which nutrients are delivered from alluvial gullies and to what extent nutrient contributions can be reduced in concert with sediment reductions.

Approved by the Hub Leader 18 Nov 2016.</td>
</tr>
</table>

C: FINANCIAL INFORMATION

Section 10. Annual financial reporting

ATTACHMENT C





Annual Progress Report

Finance Information and Asset Schedule

Financial report for the Reef and Rainforest Research Centre Ltd NESP TWQ Hub for the period 1st January 2016 to 31st December 2016

This report is provided to acquit the financial reporting requirements of the Funding Agreement with the Department of the Environment and Energy. The report contains the following information:

A. Income and expenditure statement
B. Statement of Recipient Contributions
C. Statement of Other Contributions
D. Asset schedule
E. Audit report

The financial reports have been prepared on a cash accounting basis.

Submitted by:
Name: SHERIDEN MORRIS
Telephone: 07 4050 7400
Email: sheridan.morris@rrrc.org.au

Contact officer: CONSULTANT ACCOUNTANT
Name: RACHEL SALTMARSHE
Telephone: (07) 4033 5012
Email: rachel.saltmarshe@rrrc.org.au

Date:

A. Income and Expenditure Statement

	Notes	Budget as per Approved Research Plan (a) $	Actual (b) $	Variation (a)-(b) $
Opening balance of funds	1		**687,510**	
Income				
Australian Government NESP funding	2	5,224,412	5,630,000	405,588
Interest earned	3	-	-	-
Other Activity generated income	4	-	-	-
Total income		5,224,412	5,630,000	405,588
Expenditure	5			
Research		3,854,429	3,779,713	(74,716)
Communications		1,004,490	684,300	(320,190)
Administration		365,493	293,605	(71,888)
Total expenditure		5,224,412	4,757,618	(466,794)
Surplus/(Deficit) for the period	6	-	**872,382**	**872,382**
Closing balance of funds	7		**1,559,892**	

At the end of the period there was **$1,727,846** in commitments to be paid from NESP funds.

Certifications

The following certifications are required under the Funding Agreement

By Qualified Accountant:
I certify that the statements are complete, present a true and fair view and are based on properly maintained records.

.....
Rachel Saltmarshe CA (CAANZ)
Consultant Accountant
23/02/2017

By senior representative:
I certify that the Funds have been used for the purpose for which they were provided and all terms and conditions of the Agreeement have been complied with.

.....
Sheriden Morris
Managing Director, RRRC
23/02/2017

B. Statement of Recipient Contributions

This table shows the Recipients contribution to the project during the reporting period

		Budget as per Approved Research Plan (a)	Actual (b)	Variation (a)-(b)
	Notes	$	$	$
Contribution				
Cash contribution		-	-	-
In-kind contribution		20,000	-	20,000
Total contribution		20,000	-	20,000
Contributing to:				
Research		20,000	-	20,000
Communications		-	-	-
Administration		-	-	-
Total contribution		20,000	-	20,000

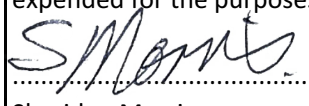
C. Statement of Other Contributions

This table shows the Other Contributions to the project during the reporting period

		Budget as per Approved Research Plan (a)	Actual (b)	Variation (a)-(b)
	Notes	$	$	$
Contribution				
Cash contribution		715,510	654,539	60,971
In-kind contribution		10,427,266	1,633,578	8,793,688
Total contribution		11,142,776	2,288,117	8,854,659
Contributing to:				
Research		11,142,776	2,288,117	8,854,659
Communications		-	-	-
Administration		-	-	-
Total contribution		11,142,776	2,288,117	8,854,659

Hub senior representative certification:

I certify to the best of my knowledge the Recipient and Other Contributions have been provided and expended for the purposes of the Activity.



.....

Sheriden Morris

Managing Director, RRRC

5th May 2017

D. Asset schedule (if required)

This table is to be provided each year and updated in the reporting period for any new asset procurements or disposals

Where the Department has given approval for the purchase/lease of an asset using NESP funds, the following information is to be provided:

Asset number in organisation asset register	Description of Asset	Creation, acquisition or total lease cost ($)	Percentage NESP funding (%)	Date of creation, acquisition or lease	Estimated Life of asset or Term of lease	Location of Asset	Method of, and date, which Asset was written off or Disposed of
NA	Sontek-SL 1500-3G 2-D SID	17,048.00	100	21/07/2016	NA	JCU	NA

REEF AND RAINFOREST RESEARCH CENTRE LTD

NATIONAL ENVIRONMENTAL SCIENCE PROGRAMME (NESP)

MANAGEMENT CERTIFICATE

I hereby certify that all funding received in respect of the National Environmental Science Programme (NESP) from the Commonwealth of Australia as represented by the Department of the Environment & Energy has been expended for the purpose of the Programme and in accordance with the contract between Reef and Rainforest Research Centre Ltd and the Commonwealth of Australia as represented by the Department of the Environment & Energy for the funding period from 1 January 2016 to 31 December 2016.

REEF AND RAINFOREST RESEARCH CENTRE LTD



Sheriden Morris
Managing Director

Dated this 23rd day of February 2017.

Crowe Horwath.
Crowe Horwath Australasia
PART OF FINDEX

Crowe Horwath Audit Queensland
ABN 13 969 921 386
Member Crowe Horwath International

Audit and Assurance Services

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Australia

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Reef and Rainforest Research Centre Limited

Independent Auditor's Report to the Australian Government Department of the Environment

Opinion

We have audited the accompanying financial report, being a special purpose financial report, of Reef and Rainforest Research Centre Limited (the Company) for the delivery of the National Environmental Science Programme. This report comprises the statement of receipts and expenditure for the year ended 31 December 2016, notes to the statement of receipts and expenditure and the Management Certificate. The financial report has been prepared by the management of the company in accordance with the funding agreement standard terms and conditions.

In our opinion, the accompanying financial report of the company has been prepared, in all material respects, in accordance with the funding agreement terms and conditions for the National Environmental Science Programme for the year ended 31 December 2016.

Basis for Opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of the Company in accordance with the auditor independence requirements of the *Corporations Act 2001* and the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of Matter – Basis of Accounting

We draw attention to the funding agreement standard terms and conditions, which describes the basis of accounting. The financial report has been prepared for the purpose of fulfilling managements financial reporting responsibilities to the Commonwealth of Australia as represented by the Department of the Environment. As a result, the financial report may not be suitable for another purpose. Our opinion is not modified in respect of this matter.

Responsibilities of Management for the Financial Report

Management of the Company are responsible for the preparation of the financial report in accordance with the funding agreement terms and conditions, and for such internal control as management determines is necessary to enable the preparation of the financial report that is free from material misstatement, whether due to fraud or error.

In preparing the financial report, management are responsible for assessing the ability of the company to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intend to liquidate the company or to cease operations, or have no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Report

Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of this financial report.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at: http://www.auasb.gov.au/auditors_files/ar3.pdf. This description forms part of our auditor's report.

Crowe Horwath

Crowe Horwath Audit Queensland

Donna Sinanian
Associate Principal

Signed at Townsville, 23 February 2017

Financial information provided after meeting with the department on Thursday 4th May 2017 can be also be found in Attachment C.

Section 11. Other information (if any)

Case Studies are provided in Attachment D.