



Annual Highlights 2017-2018



Anemonefish (*Amphiprion percula*) at Russell Island, Great Barrier Reef. Photo: Suzanne Long



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From the Board

The Reef and Rainforest Research Centre (RRRC) is an enterprising Australian-based not-for-profit company. Its purpose is to build the scientific knowledge base to underpin the conservation and sustainable development of tropical Australia and beyond. For over ten years the company has successfully worked at the intersection of conservation, policy and management, economic development and community well-being.

Welcome to our annual highlights publication for 2017-18, in which our major activities and achievements for the year are briefly described. These include:

- administering and delivering the Australian Government's National Environmental Science Program's \$31.98 million Tropical Water Quality Hub, involving over 130 scientists from six research organisations
- working with GBRMPA, CSIRO and AMPTO to help ensure the Great Barrier Reef's crown-of-thorns starfish control program is as efficient and effective as possible
- our groundbreaking work building community capacity and resilience in the Treaty Villages of Papua New Guinea, on behalf of DFAT
- hosting the Indigenous-led consortium delivering the Reef 2050 Traditional Owner Aspirations Project all along the Great Barrier Reef
- working with tourism industry partners and GBRMPA to increase understanding of fine-scale influences of water flow and temperature on coral bleaching and mortality, with a view to developing adaptive management options

The company's key skill is translating science knowledge into improved environmental outcomes, resulting in increased local and regional wealth and new jobs. In that context it is particularly pleasing to see RRRC products – from many previous projects as well as our current portfolio – being used by more than 80 organisations, including the Australian, Queensland and Papua New Guinea governments, regional natural resource management groups, local government, industry (tourism, agriculture, fishing), conservation organisations and Torres Strait and Aboriginal bodies. Please see the “Our Impacts” section of this publication for details.

The reasons for the RRRC's enduring success are the quality and dedication of the staff of the RRRC, a skilled and committed Board, the ongoing support of the ten members of the RRRC consortium, and the company's strong collaborative networks. All share the goal of building research capacity focused on the needs of end users.





Chair & Directors 2017-2018

Dr Ian Poiner, *Chair*

Russell Beer, *Deputy Chair*

Sheriden Morris, *Managing Director & Company Secretary*

Dr Andrew Ash

John Gunn (resigned November 2017)

Dr Paul Hardisty (appointed May 2018)

Prof Marcus Lane

Stan Lui

Col McKenzie

Cane fields in Mirriwinni. Photo: Boyd Robertson

Members of the RRRC Consortium

James Cook University (JCU)

Australian Institute of Marine Science (AIMS)

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Griffith University (GU)

Association of Marine Park Tourism Operators Limited (AMPTO)

Queensland Tourism Industry Council (QTIC)

FNQ NRM Limited (trading as Terrain NRM)

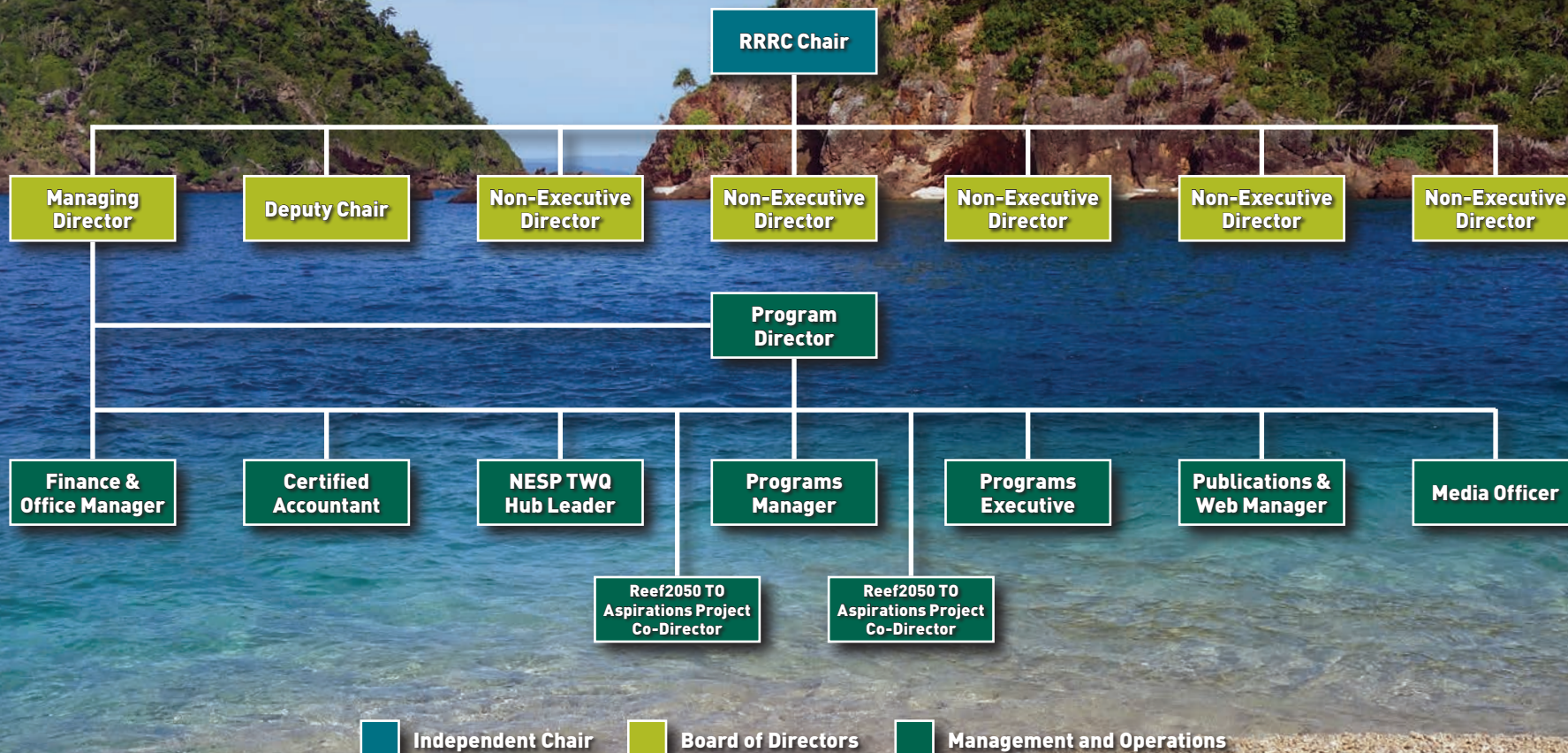
Wet Tropics Management Authority (WTMA)

Great Barrier Reef Foundation (GBRF)

Skyrail Rainforest Foundation (SRF)



Governance and organisational structure



Our Programs

In 2017-18 the RRRC administered, led and/or hosted five major programs and a number of other smaller projects across the region.



National Environmental Science Program's Tropical Water Quality Hub

With a total value of \$52 million (2015-2021), the Tropical Water Quality Hub (TWQ) is the largest of the research hubs funded by the Australian Government's National Environmental Science Program. Led by Prof Damien Burrows from JCU, and hosted by RRRC, it involves over 130 researchers from six research institutions working to improve understanding of water quality and coastal management for the Great Barrier Reef. The focus is on collaborative research that delivers accessible results and informs decision-making by stakeholders. The Hub also has an independent Hub Steering Committee led by Leith Bouilly that reports directly to the Department of Environment and Energy.

This has been a landmark year for the Reef. Like many reefs around the world, the Great Barrier Reef is suffering from the combined effects of many threats and disturbances, including mass coral bleaching, pollution, storm damage, and outbreaks of pests like Crown-of-Thorns starfish, among others. While some of these threats are caused or exacerbated by global issues such as climate change, others may be amenable to local- or regional-scale intervention, restoration and management. Unfortunately, we currently have limited knowledge about these options and how they might be effective on the Great Barrier Reef.

The approval of Research Plan Version 4 in early 2018 has brought the total number of projects funded through the Hub to date to 70. The coordinated suite of new projects commencing this year represent a deliberate pivot towards filling scientific gaps in what we need to know to promote survival, recovery and resilience of the Great Barrier Reef in the face of major disruptions such as climate change.

Simultaneously our Hub researchers and stakeholders continued to work closely together to address the regional drivers of health impacts on the reef, such as high sediment and nitrogen levels in runoff from coastal catchments. Close relationships with farmers and industry are critical to achieving these outcomes, and engagement frameworks and trust being built are proving to be key to the success of these projects. This capacity for sustained, meaningful two-way engagement between researchers and stakeholders is a strength of the TWQ Hub.

Some of TWQ Hub's most exciting projects were showcased to a wide and diverse audience of over 90 scientists and stakeholders in Townsville in late November 2017. Videos of many of the presentations are publicly available online.



Aaron Davis water sampling for Project 25. Photo Boyd Robertson

Sediment-laden floodwaters discharging into the Great Barrier Reef. Photo Catherine Collier





National Environmental Science Programme

 **\$31.98m**

investment through the NESP

 **\$20.02m**

in cash & in-kind contributions



research institutions

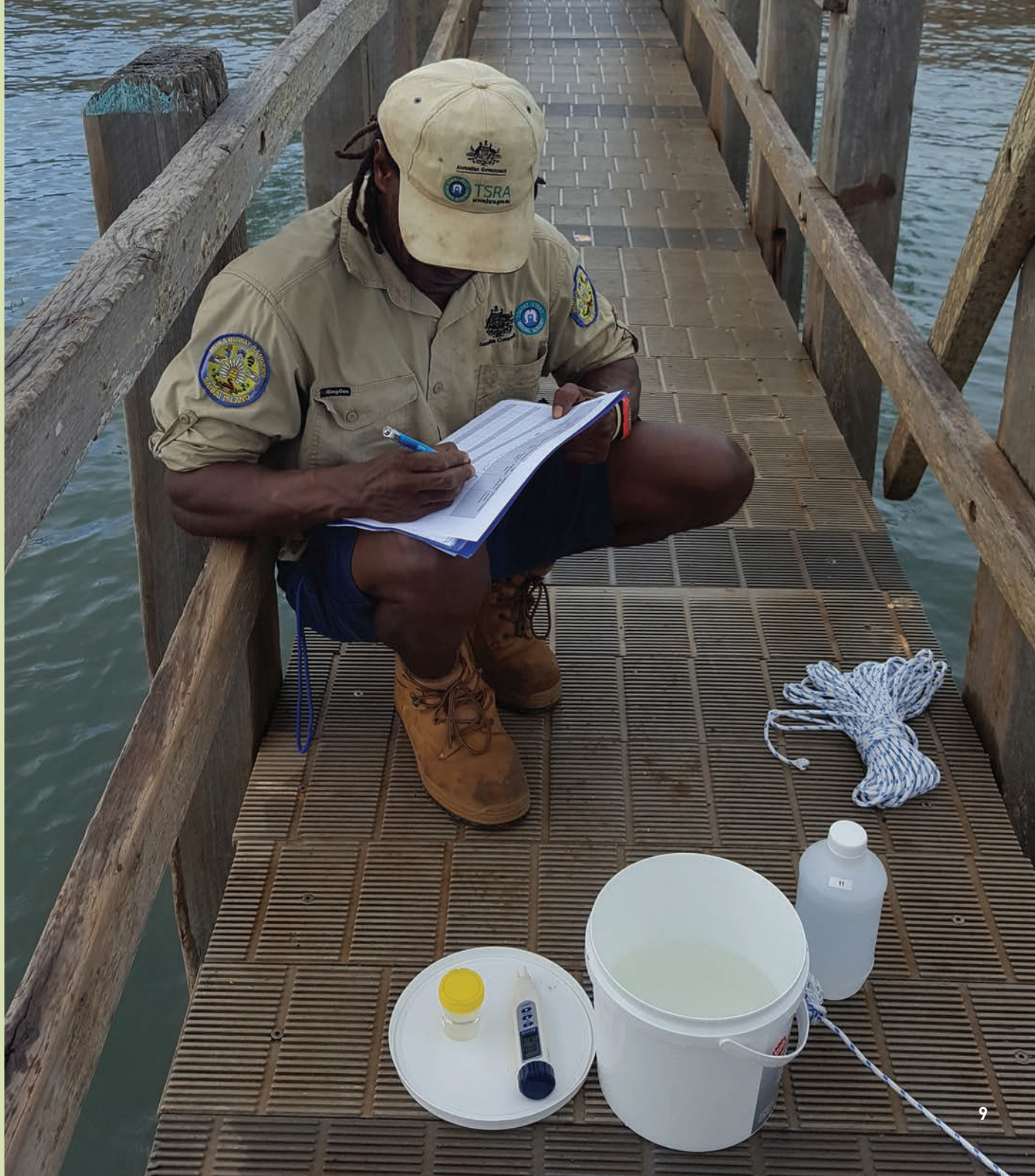


researchers



projects

Salinity monitoring on Saibai island in the Torres Strait.
Photo Jane Waterhouse



Building Resilience in Treaty Villages

The Building Resilience in Treaty Villages (BRTV) project funded by the Australian Department of Foreign Affairs and Trade (DFAT) is working with all 13 Treaty Villages in the South Fly District of Western Province, Papua New Guinea. This region is of strategic importance to Australia under the Torres Strait Treaty and the close family ties between the PNG Treaty Villages and the Torres Strait and Cape York region in north Queensland. RRRC is delivering this project in partnership with INLOC International.

The Treaty Villages experience seasonal flooding, extended drought periods, high water tables, extreme coastal erosion, sea level rise and lack of infrastructure, all of which present operational

barriers to enabling improvements in healthcare, clean water, sanitation and hygiene. The 'change to resilience' framework developed by this project is based on the successful Land and Sea Ranger programs in action across northern Australia over the last decade. The experience and lessons learnt from the Australian Ranger programs has informed both the theory and the practical implementation of the project.

The Ranger program has been running in Papua New Guinea since 2013 and has been proven to be highly successful and cost effective. On-ground training and logistics support is provided by Cairns-based group INLOC International

who are extremely experienced in delivery of remote area services. To this strong operational platform, the RRRC adds science and technical advances that have been developed in our region to enable improvements to be delivered in the communities where it is needed.

Candidate rangers are nominated by their own communities and graduate after an 8-month training period as fully-fledged Community Rangers. One indication of the success of the program to date has been the remarkable 100% retention of trainees as Rangers following graduation.

Rangers lead monthly Community Action Days in support of a wide range of activities such as constructing wells and water storage facilities and providing first aid. Recently Rangers are also receiving agronomy training in planting and harvesting new cultivars of drought- and salt-resistant food crops, and participating in reviews of current fishing, fish handling, post-harvest food preservation and storage. Water Management Plans are now in place to control access to water storage tanks to ensure access to drinking water throughout the summer and enable key community facilities, such as the Mabaduan School and Aid Post, to remain open despite water limitations.

Training on well construction. Photo: INLOC





Rangers installing notice board in Siga. Photo: INLOC



13 Treaty Villages



34 Female Community Rangers



76 Male Community Rangers



10 Ranger Support Officers (disabled)



1.3 Million litres of water-holding capacity



10 New wells



61 Kit toilet facilities



14 Air-dryers being used to preserve food



2 Microbusinesses providing economic opportunities



Rangers Sewing. Photo: INLOC

Senior Community Ranger profile: Nahidi from Sui Village

Empowerment of women is an important focus of this community resilience project. Female Community Rangers have been actively encouraged to take on greater leadership roles in the Ranger group as well as in their villages, and have been integral in the delivery of women's health education, reproductive health services and the Magic Bag business across the Treaty Village region.

Senior Community Ranger Nahidi from Sui Village is one of 34 female Rangers who

have graduated from the program to date and are currently working across the 13 villages to improve their communities' social, environmental and economic resilience. She said that the skills and experience gained through the training program and subsequent employment were life-changing, for herself and her village. "Now we are able to help our people with better access to water and toilets and health. We know how to deal with some of our problems. We don't have to wait for someone else to help us."

Nahidi (left) and Nellie, two of the 34 female Community Rangers who have graduated from the Building Resilience in Treaty Villages program to date. Photo: INLOC





Western Province, PNG Treaty Village Rangers and communities designed their own badges

Crown-of-thorns Starfish Control Program

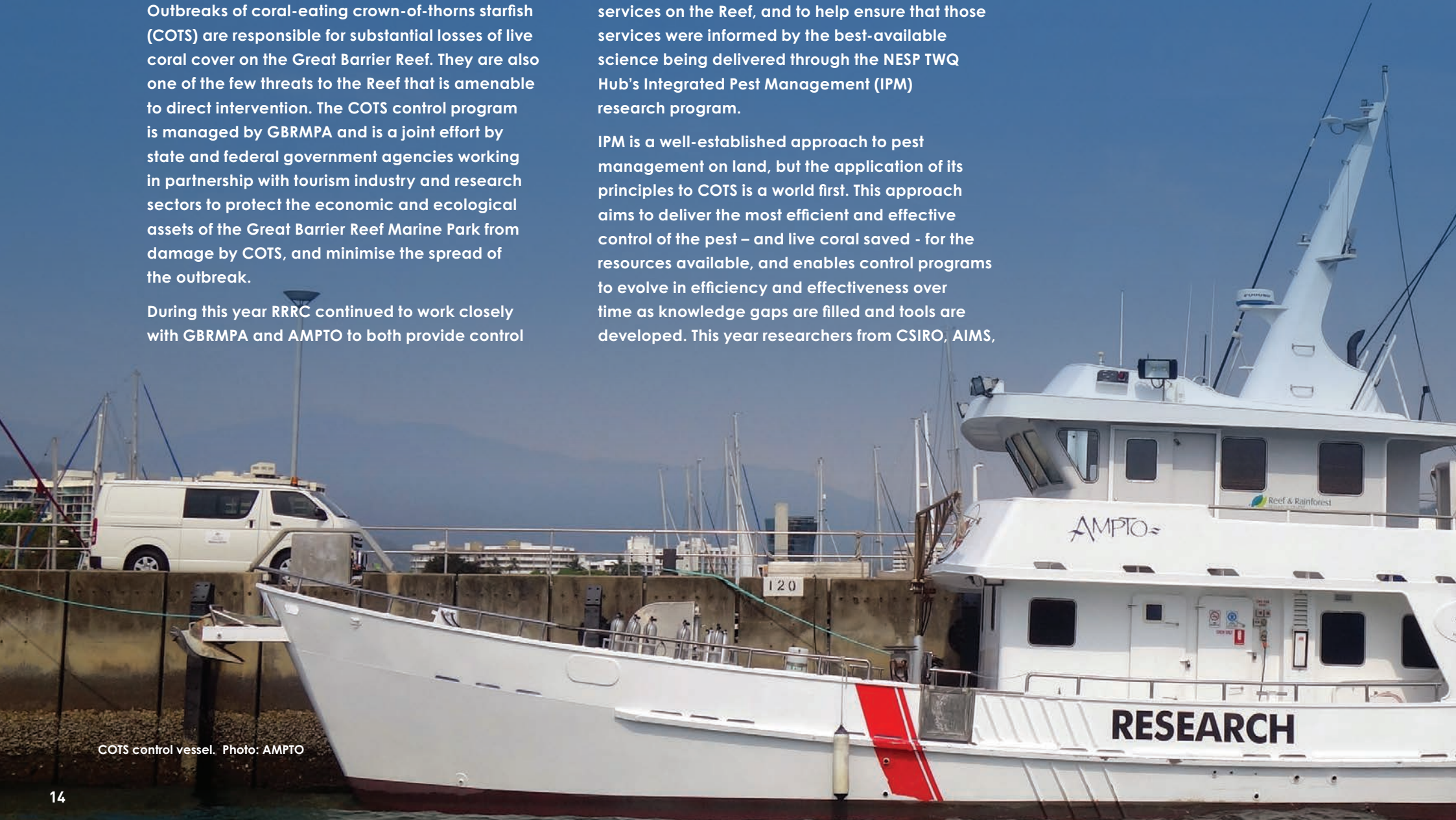
Outbreaks of coral-eating crown-of-thorns starfish (COTS) are responsible for substantial losses of live coral cover on the Great Barrier Reef. They are also one of the few threats to the Reef that is amenable to direct intervention. The COTS control program is managed by GBRMPA and is a joint effort by state and federal government agencies working in partnership with tourism industry and research sectors to protect the economic and ecological assets of the Great Barrier Reef Marine Park from damage by COTS, and minimise the spread of the outbreak.

During this year RRRC continued to work closely with GBRMPA and AMPTO to both provide control

services on the Reef, and to help ensure that those services were informed by the best-available science being delivered through the NESP TWQ Hub's Integrated Pest Management (IPM) research program.

IPM is a well-established approach to pest management on land, but the application of its principles to COTS is a world first. This approach aims to deliver the most efficient and effective control of the pest – and live coral saved - for the resources available, and enables control programs to evolve in efficiency and effectiveness over time as knowledge gaps are filled and tools are developed. This year researchers from CSIRO, AIMS,

COTS control vessel. Photo: AMPTO



JCU and UQ continued to actively investigate improvements and new approaches including new technologies and strategies for surveillance and control.

The COTS control program involving AMPTO also includes one of the most successful youth employment programs ever delivered through the Queensland Government's Skilling Queenslanders for Work program, with 85% of 230 young trainees (to date) now in full time employment, most in marine and tourism industries. Around 50% of the trainees are Indigenous, so this program is not only helping to improve coral cover through COTS control, but is changing lives in far north Queensland Indigenous communities.





COTS Targeted Control Program team filling in datasheets as they return to the ship. Photo Suzanne Long

Trainee marking size classes on PVC hooks, COTS Targeted Control Program, Great Barrier Reef. Photo Suzanne Long



COTS trainee profile: Mr William Lyons

Recent graduate Mr William Lyons plans to use his skills and experience developed through his COTS traineeship to set up a COTS control program in his home, the Torres Strait. For now, he has been offered employment as a full-time diver as part of the COTS control program, and plans to gain more experience in this role before aiming to establish a Torres Strait-based version on Thursday Island, employing Islanders as divers.

"It's the same Reef up there and it's people's whole lives, they live off it," he said. "It's got to be protected and this program's given me the opportunity to do it. If we can look after the Reef and teach some great skills at the same time, that'd be great."



William Lyons being interviewed by Izabella Staskowski of WIN News after graduating from his traineeship. Photo Boyd Robertson



COTS trainee profile: Ms Kaletta Savage

Kaletta Savage is from the Torres Strait's Mua Island, and entered the training program to be a COTS control diver. However upon completing all her diving and boating courses, she found her skills were in demand by the tourism industry, and she is currently loving her job as a divemaster and coxswain for major reef tour operator Ocean Freedom.

Kaletta said the training she received through the COTS program was a 'life-changing' opportunity for her.

"Getting involved in the program was definitely a life-changing decision for me," she said. "It's enabled me to gain these skills and access opportunities that I don't think I would have ever had the chance to otherwise. I'm really glad I did it, I think it's a great program."

"Life-changing." Thanks to her qualifications acquired through the COTS trainee Skilling Queenslanders for Work Program, Kaletta Savage from Mua Island in the Torres Strait is now employed full-time as a divemaster and coxswain in the highly skilled and competitive Cairns reef tourism industry. Photo: Boyd Robertson

Reef 2050 Traditional Owners Aspirations Program

There are at least 70 Traditional Owner (TO) groups with rights, interests and aspirations in sea country across the length of the Great Barrier Reef (GBR), stretching from the Burnett Mary region into the Torres Strait and spanning tribal, clan and family groupings. Traditional Owners of the Great Barrier Reef are bound to a set of inherent rights and interests that govern all ways of life on Country. The Reef 2050 Traditional Owner Aspirations Project is hosted by RRRC and led by Traditional Owners to better understand and reflect aspirations for the protection and management of the Great Barrier Reef and provide this input to improve the Reef 2050 Plan.

This project is coordinating and consulting with Traditional Owners to make clear the priority actions and funding needed for Traditional Owner involvement in implementing the existing commitments under the Reef 2050 Plan. It is building on previous work that Great Barrier Reef Traditional Owners have undertaken with their partners and will help to create a shared understanding of Traditional Owner rights, responsibilities and aspirations, as presented throughout the Reef 2050 Plan. It is also providing Traditional Owners the opportunity to discuss larger policy issues concerning the future protection and management of the Great Barrier Reef.

A Reef-Wide Traditional Owner Forum was held in Palm Cove from 1-3 May 2018, bringing together over eighty Traditional Owners from the full geographic extent of the GBR. The agenda, meeting report and copies of the powerpoint presentations are available online via the project page on the RRRC website.

The project's interim report (released in June 2018 and publicly available via the project page on the RRRC website) describes a need for greater clarity in the linkages between the

Reef 2050 Plan, implementation approach, the current Actions and the foundational agenda of Traditional Owners - established through decades of sea country planning and management. At this stage the project's key priority is to improve the relationships (and understanding of these relationships) between the Actions, the Implementation Approach, and both the Australian and Queensland governments' and the Traditional Owners' agendas across the GBR region.



Some of the Traditional Owners discussing ways forward at the Palm Cove Forum; (R-L) Eddie Savage, Eddie Smallwood, Alan Dale, Duane Fraser, and Brian Johnson. Photo: Boyd Robertson

Reef Havens Research Project

The 2017 mass coral bleaching event caused up to 80% mortality on some reefs in the Cairns region of importance to the marine tourism industry. However, even on reefs badly affected by bleaching, mortality was patchy. Anecdotal observations suggested that corals with access to cooler or even just flowing water appeared to bleach less badly and recover better. During the latter half of 2017, RRRC worked closely with the tourism industry, scientific and engineering experts, and the Australian Government's Reef Trust to explore whether mitigation of coral stress under bleaching conditions might be feasible at the scale of a reef tourism site.

Having identified knowledge gaps and potential mitigation opportunities associated with restoring “normal” water column mixing processes – which fail under abnormally hot and low-wind conditions – the team commenced work on the three-year Reef Havens Research Project in December 2017.

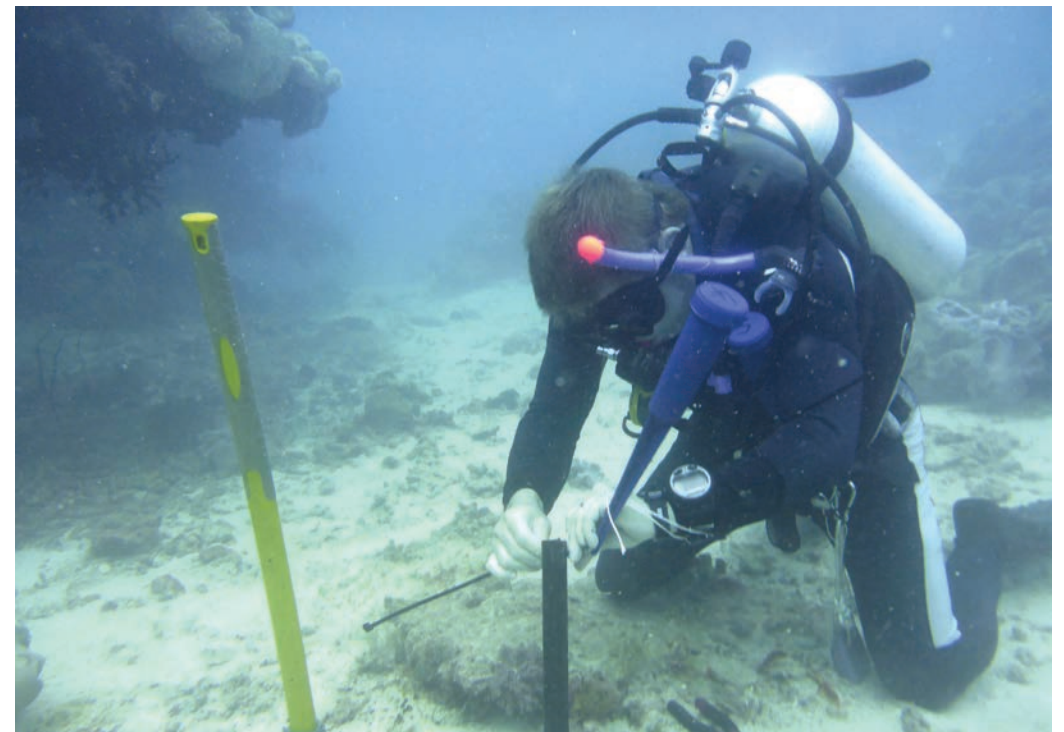
This research collaboration between reef researchers, the marine tourism industry, engineers and managers has established an in-situ research platform at Moore Reef near Cairns that will be used to increase mechanistic understanding of patterns in local-scale coral bleaching and recovery, and provide a field test-bed for lab and modelling studies. The Reef Havens Research Project has an independent scientific Steering Group and all data will be publicly available. Installation of the sensor network (current and temperature meters) commenced in mid-2018.

A special session on fine-scale hydrodynamics convened at the GBR Restoration Symposium in Cairns contained a number of presentations discussing the Reef Havens Research Project, the underlying oceanography and the team's progress to date.



Acropora coral colonies in various stages of fluorescing and bleaching, Great Barrier Reef, March 2017. Photo Suzanne Long

Installation of one of the current and temperature meters at the Reef Havens Research Project site at Moore Reef, Great Barrier Reef. Photo Eric Fisher



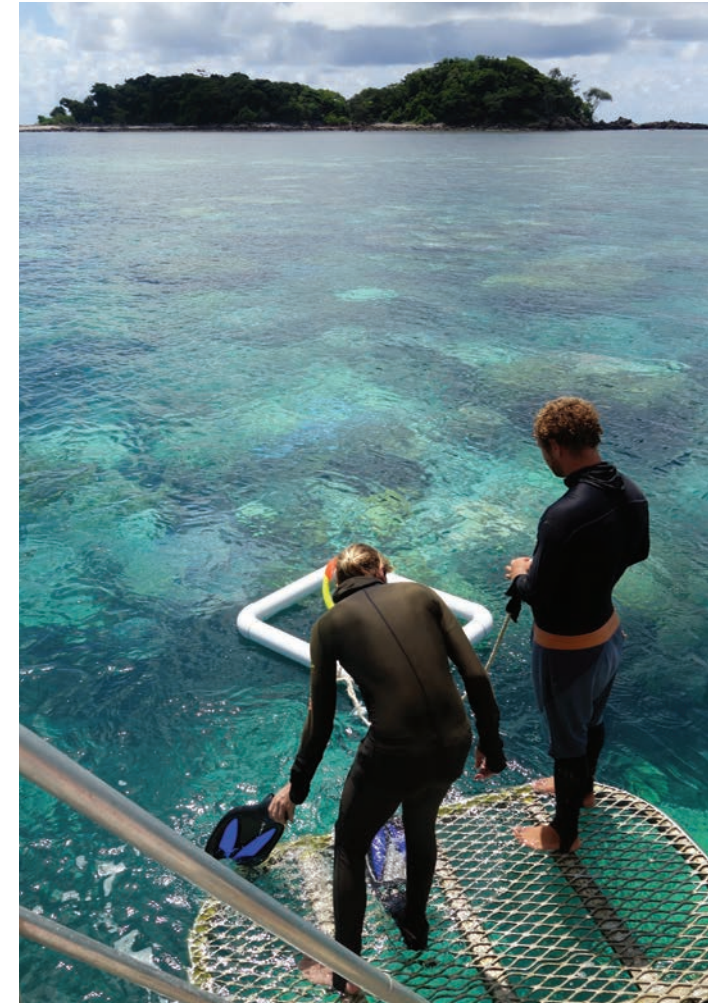
Impacts of coral bleaching events on tourism-dependent coastal communities

In the wake of the back-to-back mass coral bleaching events in 2016 and 2017, RRRC commissioned Prof Bruce Prideaux and team at CQU to investigate the likely social and economic impacts on the tourism industry and tourism-dependent human communities of coastal Queensland.

They found that the Cairns community is highly engaged with the GBR and places high value on its protection, and that business leaders understand that further declines in health (or perceived health) of the GBR poses a significant threat to long-term community resilience. However, they also found that the community is unprepared for the possible future declines in coral reef tourism that may eventuate if bleaching events continue to occur.

To avoid or minimise adverse economic impacts, the researchers recommended urgent action to increase the resilience of coral reef-dependent economic sectors and communities by revitalising existing marine tourism experiences, broadening the range of tourism experiences on offer over the longer term, and creating opportunities for local action against the global phenomenon of mass coral bleaching. They noted the potential for coral restoration programs to provide economic as well as ecological benefits to the tourism industry and reef-dependent communities generally.

Impacts of the 2016 and 2017 mass coral bleaching events on the Great Barrier Reef tourism industry and tourism-dependent coastal communities of Queensland



People preparing to snorkel over bleached and fluorescing reef, Frankland Islands, Great Barrier Reef. Photo: Suzanne Long

Mentoring program

RRRC takes our responsibilities to help develop the next wave of northern Australia's leaders seriously. This year we have mentored two emerging research leaders.

RRRC Mentee Profile: Dr Cass Hunter



Dr Cass Hunter is a research scientist for the CSIRO Coastal Development and Management program in Oceans and Atmosphere, Cairns. Dr Hunter's role as an Indigenous social-ecologist is to develop visualisation and predictive tools to address priority issues of Indigenous communities and government agencies in northern Australia and our near neighbours in PNG and Indonesia.

With an aim to support sustainable livelihoods and ecosystems, Dr Hunter is being mentored by RRRC to increase learning about how science outputs can be

collated, designed, communicated, stored and retrieved in ways that are useful to communities. According to Dr Hunter, "This translation of research helps to make it more inclusive, accessible, and relevant for our communities. Co-location at RRRC has given me valuable insight into the skills for working with governments and actively addressing the environmental issues facing northern Australia. The values of RRRC also align with my ethos of working in collaboration with Indigenous communities through co-development of science."

RRRC Board Diversity Program Mentee profile: Dr Liz O'Brien

As a Senior Research Development Manager for water at Griffith University, Dr Liz O'Brien leads the development of strategic research partnerships in research between scientists, industry and government, with her role there resulting in over \$27.5M in secured grant funding, an eight-university alliance for research in the Murray-Darling Basin and negotiating a \$25M tripartite research agreement between Griffith University, University of Queensland and SEQ Water. Dr O'Brien also sits on the Steering Committee of the NESP TWQ Hub, and through this role was selected as the RRRC's first Board Diversity Program Mentee this year.

The Board Diversity Program seeks to provide knowledge and skills and guidance to assist mentees in pursuing director appointments, as well as general career development.

"Observing and contributing to discussions at board meetings were not only invaluable for providing practical application and understanding of governance, but also served to increase confidence in providing suggestions, advice and recommendations," said Dr O'Brien. "The wealth of knowledge offered by the Board's non-executive Directors, Chair and Managing Director have all been positive contributions towards my career."



GBR Restoration Symposium

The Great Barrier Reef Restoration Symposium (16-19 July 2018, Cairns) brought together 300 leading scientists, engineers, experienced practitioners, environmental managers, industry professionals, NGOs, community members and youth representatives from 14 countries for the first international conference on coral reef restoration.

The Symposium recognised the rapidly increasing interest in reef restoration and adaptation, reflecting the growing realisation that coral reefs are in trouble globally and need our help. All around the world, coral reefs are experiencing unprecedented decline due to the combined effects of global climate change and local pressures such as pollution and overfishing. These declines undermine food security, cultural heritage and economic opportunity. They are impacting livelihoods and the wellbeing of hundreds of millions of people.

There is much we can do. Many reef regions, like the Great Barrier Reef, are still beautiful, and these are sources of hope for us all. They are the inspiration to accelerate and intensify efforts to address the big challenges of climate change, pollution from land, coastal development and unsustainable fishing.

Austin Bowden-Kerby discusses reef restoration with Louise Laing, Tess Moriarty and Austin Laing-Herbert at the Great Barrier Reef Restoration Symposium in Cairns. Photo: Boyd Robertson

Symposium participants presented and discussed methods currently being trialled elsewhere in the world, as well as novel approaches that may be still in development; from small, local-scale approaches to large-scale projects, including engineering and oceanographic interventions. Major figures in Reef restoration research like the legendary Austin Bowden-Kerby, Boze Hancock from The Nature Conservancy as well as up-and-coming stars like Tali Vardi and high-level philanthropists such as Frank Mars from Mars Foundation were in attendance.

This world-first Symposium was a collaborative effort between the NESP TWQ Hub and the Reef Restoration and Adaptation Program (RRAP), with funding support from AMPTO and RRRC. Additional partners included James Cook University, Reef Ecologic and the Reef Restoration Foundation.

The full outcomes statement, program and abstracts, and recordings of all the presentations, are available online at <https://gbrrestorationsymposium.org/>.





Tali Vardi (NOAA) speaking at the young adult workshop. Photo: Boyd Robertson

Jennie Gilbert and Symposium delegates at the Fitzroy Island turtle hospital. Photo: Boyd Robertson



"The GBR Restoration Symposium was pivotal in my understanding of precisely HOW serious Australia is about conserving its reefs. The level of funding that the government of Australia has devoted to basic reef science, connections with Traditional Owners, as well as innovative bleaching prevention techniques, has created a model that I hope the rest of the world can emulate.

Coral reefs are truly on the brink of ecosystem collapse. Bold and crazy ideas are needed. The presentations at the GBR Restoration Symposium blew me away. They highlighted the amazing caliber and out-of-the-box thinking of Australian reef scientists and changed my vision in planning Reef Futures - the first global reef restoration and intervention conference being planned to occur later in 2018 in the U.S. The rest of the coral restoration community had to hear first-hand about the innovative solutions that Australia is considering, so that the gravity and imminence of this ecological crisis could be understood by those who are attempting to address it. As such we hosted a dedicated session about Australian solutions and innovations.

Some of my favorite talks at the GBR Restoration Symposium were about innovative solutions - shading the reefs with molecule-thick chalk or injecting reefs with cold water during bleaching events, growing and harvesting algae to denitrify eutrophic reef waters, capturing spawn slick and growing baby corals on board a cargo ship to reseed the reef, and developing ideal surfaces for larval settlement. Averting the global ecological crisis of coral reef demise will likely depend on the creativity, inclusivity, as well as the scientific and engineering prowess that Australian scientists demonstrated at the GBR Restoration Symposium."

Tali Vardi, Coral Science Lead, NOAA

Our Engagement with Stakeholders

Effective engagement with stakeholders of all kinds is at the heart of the RRRC consortium's ability to achieve impact. It is the foundation of all of our projects from their inception, and we take every opportunity to continue to build alliances and advocate for increasing the science base that tropical Australia's communities need for sustainability. Some of the highlights from this year are shown below.



Dr Alan Finkel, Australia's Chief Scientist

RRRC's Program Director Dr Suzanne Long had difficulty keeping up with Australia's Chief Scientist underwater, such was his enthusiasm and interest in the nuances of coral bleaching and mortality on the Great Barrier Reef and the implications for management.

The group visited Moore Reef with Reef Magic in October 2017 and snorkelled over reef areas that are now instrumented as part of RRRC's Reef Havens Research Project.

It had been twenty years since Dr Finkel had last visited the Reef, and he said that seeing the coexistence of dead and thriving coral was quite an eye-opener. "It provides a clue as to why the reports on reef health are so diverse," he commented. "Intervention to preserve and restore key sites would seem warranted, as the longer-term climate challenges are global, with no immediate solutions in sight."



Saul Singer talking to COTS divers. Photo: Suzanne Long

Saul Singer, Board member of Innovation & Science Australia

Mr Singer travelled from Israel for the Innovation & Science Australia Board meeting in May 2018. While in Cairns he took the opportunity to look into one of RRRC's most innovative projects, in which we connect research into Integrated Pest Management of crown-of-thorns starfish (conducted through the NESP TWQ Hub) directly into in-water control operations on the Great Barrier Reef.

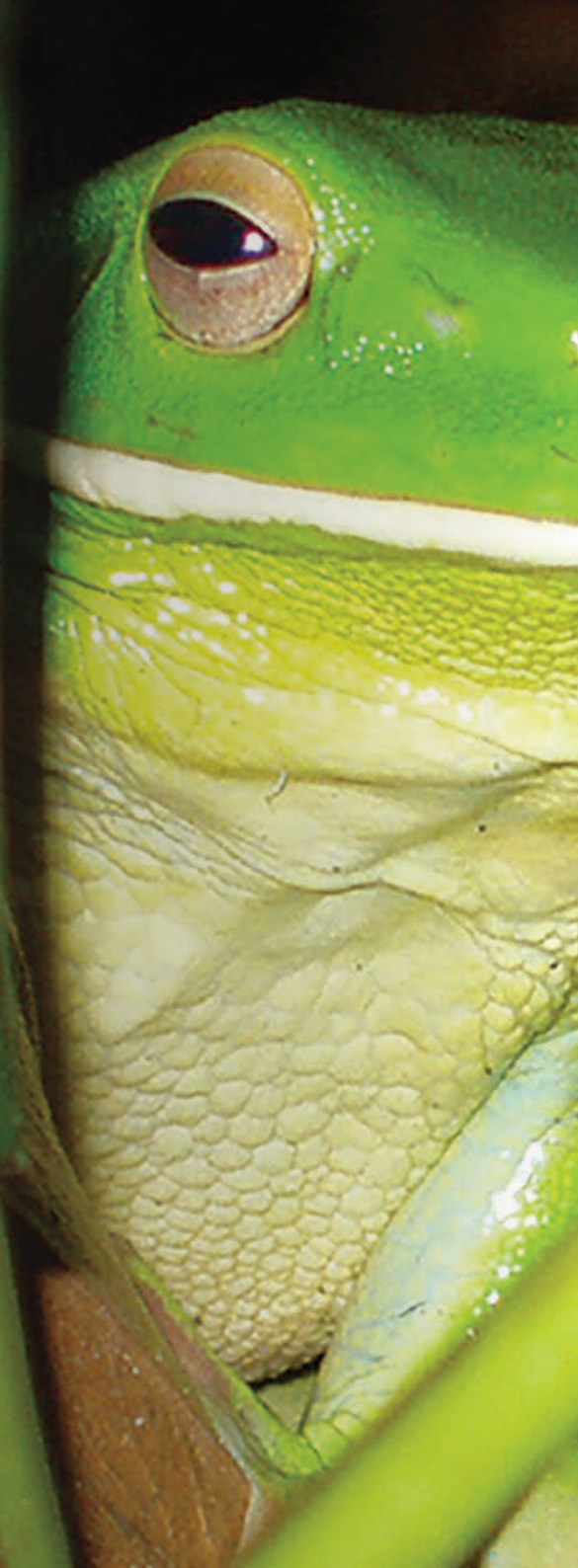
Visit to the UN

Also in October 2017, the RRRC was invited by the Hon. Warren Entsch in his role as Australian Delegate on the United Nations General Assembly to meet with various UN Ambassadors and dignitaries to showcase our work, including the Community Ranger Program pioneered by the RRRC. Among other presentations and meetings in New York, RRRC's Managing Director Sheriden Morris was the keynote speaker at a UN function hosted by the Australian and the Papua New Guinea Missions.

Partners & Stakeholders

Advance Cairns
AgForce
Alliance for Sustainable Tourism
Association of Marine Park Tourism Operators
Australian Fisheries Management Authority
Australian Institute of Marine Science
Australian Maritime College
Australian Museum
Australian National University
Australian Tropical Herbarium
Balkanu Corporation
BHP Billiton
Biosecurity Queensland
Burnett Mary Region Group
C₂O Consulting
Cairns Regional Council
CANEGROWERS
Cape York NRM
Cape York Partnership
Cape York Sustainable Futures
Cassowary Coast Regional Council
Central Queensland University
Chevron Australia
CSIRO
Dawul Waru Aboriginal Corporation
Department of Agriculture and Water Resources

Department of Foreign Affairs and Trade
Department of Prime Minister and Cabinet
Department of the Environment and Energy
Far North Queensland & Torres Strait Regional
Development Australia
Far North Queensland Regional Organisation of Councils
Farmacist
Fertiliser Australia
Fitzroy Basin Association
Gidarjil Development Corporation
Girringun Aboriginal Corporation
Gladstone Healthy Harbour Partnership
Gladstone Ports Corporation
Glencore
Great Barrier Reef Foundation
Great Barrier Reef Marine Park Authority
Greening Australia
Griffith University
Growcom
INLOC
Integrated Marine Observing System
Jabalbina Yalanji Aboriginal Corporation
James Cook University
Jaragun Pty Ltd
Kalan Enterprises
Mandingalbay Yidinji Aboriginal Corporation





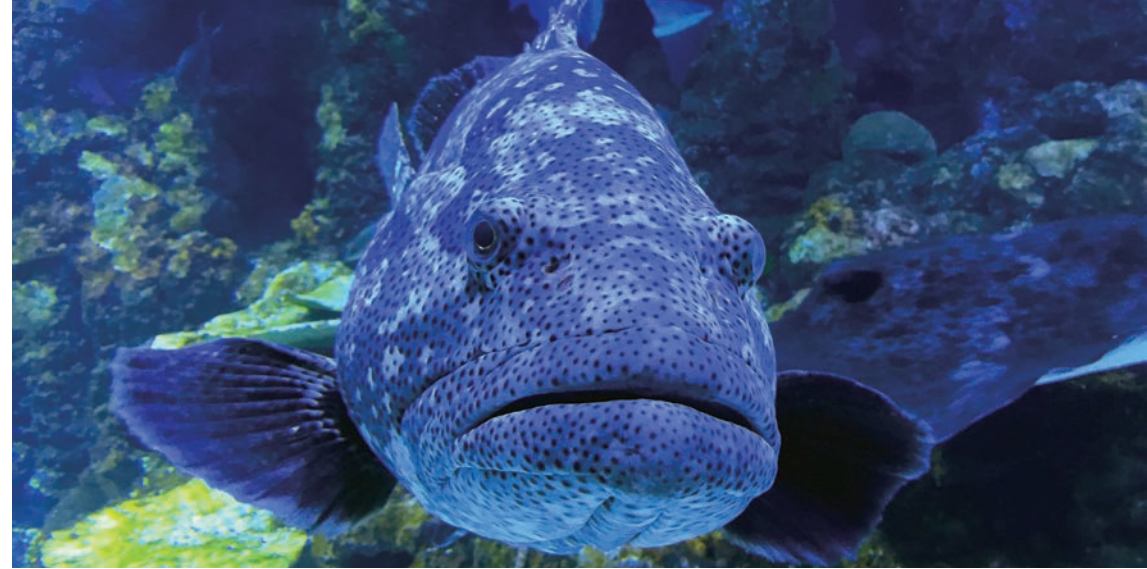
Meat and Livestock Association
Nipissing University
North Australian Indigenous Land and Sea Management
Alliance Ltd
North Queensland Bulk Ports
North Queensland Climate Alliance
NQ Dry Tropics
Port of Townsville
Ports Corporation of Queensland
Ports North
Powerlink
Projects Global
Queensland Department of Aboriginal and Torres Strait
Islander Partnerships
Queensland Department of Agriculture and Fisheries
Queensland Department of Environment and Heritage
Protection
Queensland Department of Main Roads
Queensland Department of National Parks, Sport and Racing
Queensland Department of Natural Resources and Mines
Queensland Department of Science, Information Technology
and Innovation
Queensland Department of State Development
Queensland Farmers Federation
Queensland Health
Queensland Ports Association
Queensland Seafood Industry Association
Queensland Tourism Industry Council

Rainforest Aboriginal Peoples Alliance
Reef Catchments NRM
Reef Check
Reef Water Quality Partnerships
ReefCare International
Rio Tinto
Skyrail Rainforest Foundation
Southern Cross University
Sugar Research Australia
Sunfish
Surf Life Saving Queensland
Terrain NRM Ltd
Terrestrial Ecosystem Research Network
Torres Shire Council
Torres Strait Islands Regional Council
Torres Strait Regional Authority
Tourism and Events Queensland
Tourism Tropical North Queensland
Townsville Enterprise Limited
Treaty Village Association, PNG
University of Alberta
University of Algarve
University of Melbourne
University of New South Wales
University of Queensland
Wet Tropics Management Authority
Woodside
World Wildlife Fund

Our Impact

At RRRC we believe our impact should be measured in more than just funding invested, projects delivered and scientific papers published. To achieve our long-term strategic goals of building research capacity and knowledge for a more ecologically and socially sustainable north Queensland region, we ensure the research we broker, manage and translate is driven by the needs of stakeholders and delivered to them in useful forms.

Obviously such impacts take time to achieve and demonstrate, and RRRC has been pursuing these goals for over ten years. The following section highlights just a few standout examples that have come to our attention this year, arising from our work through the Australian government's Marine and Tropical Sciences Research Facility (MTSRF, 2006-2010), the National Environmental Research Programme's Tropical Ecosystems Hub (NERP TE, 2011-2014), and the National Environmental Science Program's Tropical Water Quality Hub (NESP TWQ, 2015 – 2021), among many other programs.



Just one of the 15,000 animals on show at Cairns Aquarium. Photo: Wayne Spencer

250,000 visitors to Cairns Aquarium informed by RRRC-associated research

The opening of the Cairns Aquarium in September 2017 provided an outstanding opportunity for transfer of knowledge about the region to a potentially huge audience. Over ten years of integrated rainforest, catchment and reef research conducted through the MTSRF, NERP TE and NESP TWQ combined meant that RRRC was in a unique position to assist the Cairns Aquarium in developing educational and engaging signage for each of their exhibits.

"The interpretive signage at Cairns Aquarium developed in partnership with RRRC is providing an engaging and educational narrative for visitors to the Aquarium, describing the key ecological species and linkages as water travels from rainforest catchments into the Great Barrier Reef," said Daniel Lejpnik, Cairns Aquarium CEO. "Since we opened over 250,000 visitors have been able to interact with the information RRRC has provided, deepening their understanding of regional north Queensland and its unique environmental assets."

Visitors to the Cairns Aquarium interact with a wide range of interpretive signage providing insights into the linkages between species and ecosystems, impacts of climate change, water quality and many other issues that are past or current topics of research programs associated with RRRC. Visitors can share their new understanding and appreciation within their networks, further increasing impact locally, nationally and abroad.

Microeconomic opportunities for locals developing from our work in PNG

Our DFAT-funded Community Ranger projects in Papua New Guinea have kick-started development of two locally-run small businesses, in villages where there have previously been no opportunities for economic participation. Both these microbusinesses are related to the program's original goals of improving sanitation and health. After identifying a need for better toilet facilities, and consulting with communities, rangers have produced and are now taking orders for locally-made urinary diversion dry toilet kits, and have so far constructed 61 community and family toilet facilities across 14 villages. This toilet design is suited to the extreme rainfall/flood conditions often experienced in Treaty Villages, with minimal flooding of streets or houses during extreme wet periods or high tides. A group of female Community Rangers are being assisted by local women in another microbusiness project, making reusable cloth sanity packs ("Magic Bags").

Rangers manufacturing toilets. Photo: INLOC



Female Rangers making "Magic Bags". Photo: INLOC



Traditional Owners monitoring and restoring their own sea country

Despite the importance of estuarine wetlands to both improving water quality for the Great Barrier Reef and the Sea Country of Traditional Owners, not enough is known of the condition of degraded estuarine wetlands across the entire Great Barrier Reef coastline. As a way forward, a NESP TWQ-funded project led by Dr Norm Duke from JCU trained Indigenous rangers and citizen scientists in field assessment methods and identified high-priority degraded shorelines in eight estuaries between Gladstone and Bundaberg. Working hand-in-hand with the Gidarjil Development Corporation (GDC), this project incorporated Traditional knowledge and cultural heritage values into broad ecological assessments of mangrove condition, values and threats within GBR catchments in the context of MangroveWatch training. This in conjunction with the purchase of another vessel by GDC has enabled expansion of the Rangers' monitoring and assessment scope and enabled them to commit to the Port Curtis & Port Alma Costal Habitat Archive & Monitoring Program. These collaborations and development of the resulting Mangrove Management Plans have also enabled successful grant applications from state and federal governments to restore flood-damaged sites in two of these estuarine systems to date, as well as a successful tender for the Gladstone Healthy Harbours Program for the monitoring of healthy mangroves in and around Port Curtis.

Manager of the Gidarjil Caring for Country Program Ric Fennessy is particularly grateful for the impact Dr Duke's project has had. "The ideas proposed by Norm Duke always reflect his honest commitment and dedication to effectively engage Traditional Owner groups. We are very impressed with the MangroveWatch program which utilizes the innovative costal assessment methodology, and ended up purchasing an additional vessel to assist the program and build the Rangers' capacity to undertake other marine-based activities along the coast. There has been a marked improvement in the abilities of the GDC Rangers to collect reliable and useful field data as a result of the project." He noted that the training provided through this project was also proving useful in other Caring for Country initiatives, including mangrove community rehabilitation activities.

Scientists collaborate with Gidarjil rangers to monitor the health of the Burnett and other major river estuaries in the southern GBR region. Photo: Norm Duke





Professor Andrew Brooks.

Eureka Prize awarded to NESP TWQ team for gully remediation research

One of Australia's top science prizes has been awarded to a NESP TWQ-funded project team in 2017 for uncovering a previously under-appreciated source of negative impacts on the Great Barrier Reef, and, importantly, how to deal with them. The team, led by Prof Andrew Brooks from Griffith University, used a wide range of both high-tech and low-tech approaches to quantify the huge amounts of fine sediment being scoured from eroding gullies and streambanks in the vast Great Barrier Reef catchments of north Queensland's cattle country.

When traditional approaches to erosion mitigation proved ineffective or even counter-productive, the team turned to minesite rehabilitation techniques including full reconstruction of gullies with industrial equipment. The project has already had measurable positive impacts, informing changes in Queensland government policy toward erosion management. Prof Brooks, who has been working on the project in various forms for over a decade, said the Eureka Prize was 'very unexpected' but a 'definitely a career highlight'.

Saving seagrass: Clear and consistent guidance on critical light thresholds

Seagrass meadows are the habitat most likely to be directly affected by coastal and port developments due to their proximity inshore and along sheltered parts of the coast. Development approvals therefore require that water quality, and specifically light, are maintained within acceptable levels. A series of research projects funded through MTSRF, NERP TE and NESP TWQ investigating critical light thresholds for seagrass have enabled evidence-based sediment load targets to be included in the **Reef 2050 Water Quality Improvement Plan**. These thresholds and targets can be applied to ensure protection

of seagrasses from activities that impact water quality and the light environment over the short-term, such as coastal and port developments. The clear and consistent guidance on light thresholds to apply in managing potential water quality impacts to seagrass provided in a resultant **NESP TWQ-funded synthesis report** – led by Dr Catherine Collier from JCU – substantially informed the **2017 Scientific Consensus Statement for the Great Barrier Reef**. This is a great example of how a series of targeted, applied research projects driven by stakeholder needs can fill critical gaps and improve management.

Seagrass meadows at Clack Reef on the Great Barrier Reef. Photo: Catherine Collier





What rainforest plant is that? Online taxonomic key used by thousands per year

How to identify plants in one of the most biodiverse rainforests on earth? Specialists from a wide range of institutions have toiled for over 50 years to generate taxonomic keys for a range of Wet Tropics plant groups. In 2009, MTSRF funding contributed to the Australian Tropical Herbarium (ATH) incorporating all vascular plants found in Wet Tropics rainforest habitats into a single taxonomic key, at that time a unique achievement for any rainforest in the world. This invaluable tool for managers, scientists and decision makers was first made available online in 2010 (Australian Tropical Rainforest Plants, Edition 6) with the aim of enabling as many people as possible to simply and accurately identify and learn about plants in Australia's tropical rainforests. Dr Frank Zich from CSIRO, who has been involved with the project for decades, said that since the key had been made available online, it had received in the order of 800-900 unique visitors per month. The key is also regularly used to train professional ecologists working in environmental impact assessments in the Wet Tropics.

Australian Tropical Rainforest Plants

EDITION 6 Trees, Shrubs, Vines, Herbs, Grasses, Sedges, Palms, Pandans & Epiphytes

Start Identification

Species Information




- Browse All
- Browse by Family
- Browse by Common Names

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- About the rainforest
- Acknowledgements

Resources

- Character help notes
- Glossary
- How to use the key
- Feedback



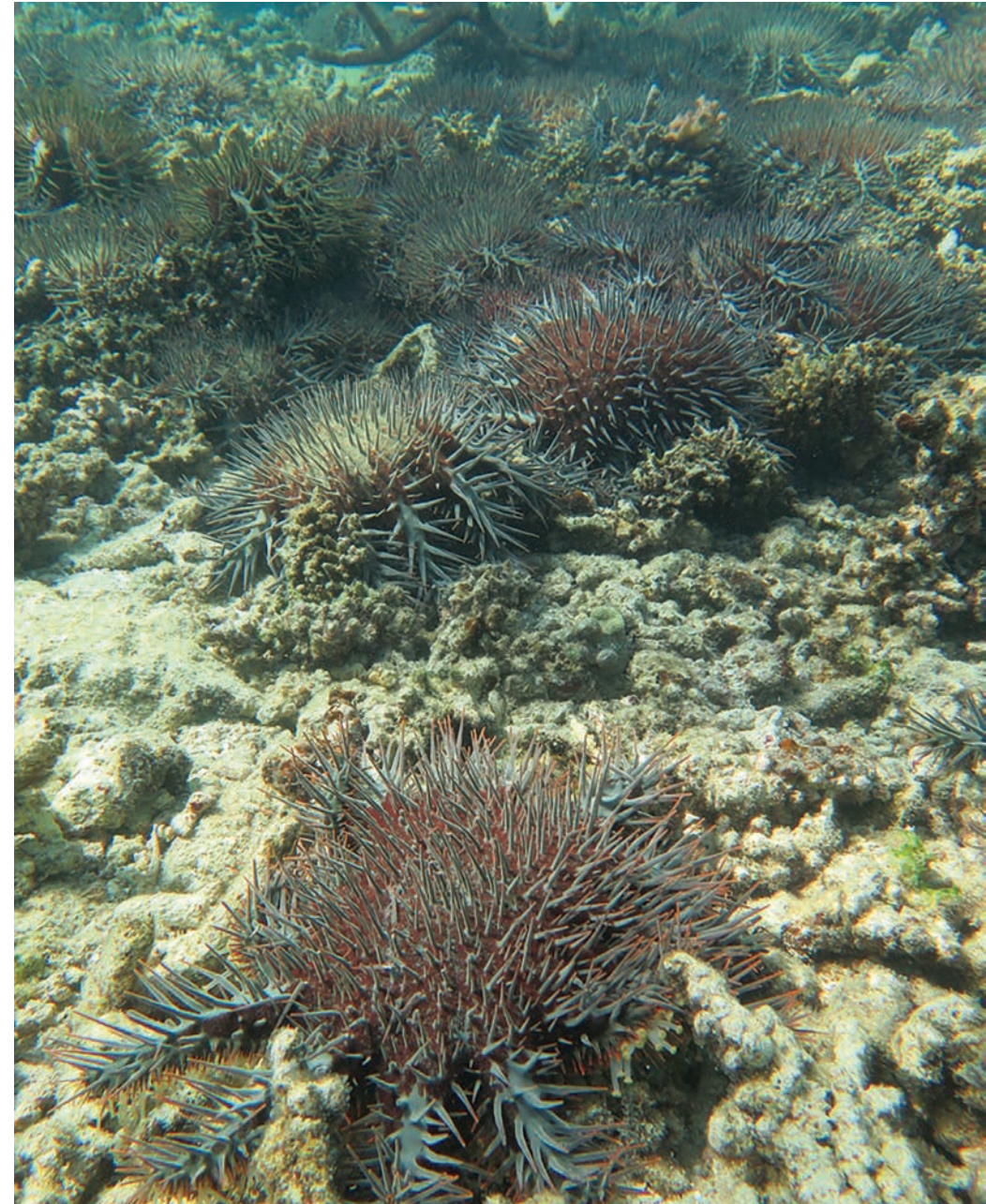
Defending live coral cover: adoption of Integrated Pest Management approach across expanding COTS control program

Recommendations developed by a coordinated program of NESP TWQ research have already revolutionised the effectiveness of crown-of-thorns starfish (COTS) control on the GBR. The Integrated Pest Management (IPM) approach has been fully adopted by the management agency, GBRMPA, and is being rolled out across the expanding COTS control program.

Up until 2012, COTS predation was responsible for the greatest loss of coral cover on the GBR, and controlling their numbers remains one of the only pressures on coral cover amenable to active intervention. Following the back-to-back mass coral bleaching events, defending the surviving coral from COTS predation became even more critical. The NESP TWQ research program drew together researchers, industry and government in a world-first effort to apply IPM principles to control of a marine pest. "The key objective for the NESP TWQ COTS research program has been to work with researchers and managers to develop a management strategy that reflects the realities of both the ecology of COTS outbreaks and of the control capabilities," said Dr David Westcott from CSIRO, who leads the multidisciplinary multi-agency research effort.

Mr Steve Moon, who manages on-water operations of the COTS crews for AMPTO, said that the access to the latest research and researchers through the NESP TWQ had definitely helped improve the effectiveness and efficiency of their work. "The research has been an extremely valuable addition to the program."

In his presentation to the GBR Restoration Symposium in July 2018, GBRMPA's Director of Reef Interventions Mr Darren Cameron outlined how the expanding COTS Control Program would adopt the recommendations from the NESP TWQ research program. Many of the researchers, AMPTO and representatives from the tourism industry also presented at this special COTS session, and all the presentations are publicly available online.



Crown-of-thorns starfish outbreak on Rib Reef, Great Barrier Reef. Photo: Morgan Pratchett

Financial Summary

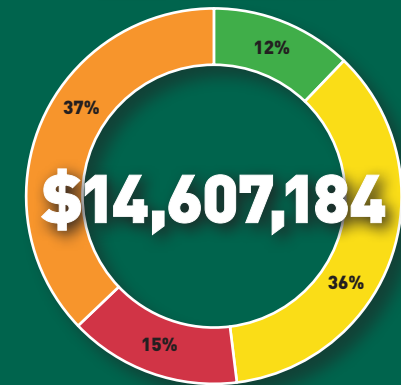
During 2017-18 RRRC's principal activities consisted of administering Australian Government contracts managed by the Department of the Environment & Energy (DOEE) to provide services for program management of, and communications services for the National Environmental Science Program (NESP) including administration of the NESP Tropical Water Quality Hub. Other significant activities included project management of implementation contracts for Crown of Thorns projects funded by the Department of the Environment & Energy and Great Barrier Reef Marine Park Authority (GBRMPA) and for the PNG BRTV project funded by Abt Associates Pty Ltd.

There were no other significant changes in the nature of the company's operations, being the provision of project management and administrator services for research and development activities.

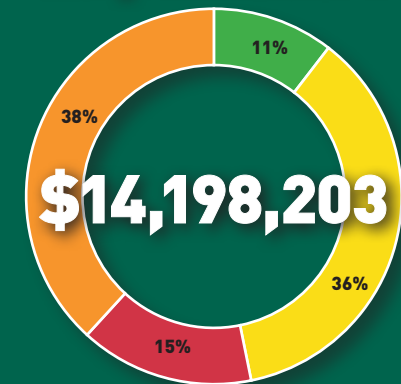
Total income earned for 2017-18 was **\$14,607,184**.

RRRC's expenditure in 2017-18 consisted of payments to research institutions for research contracts, payments to contractors for implementation contracts and corporate expenditure on project management activities including website development, knowledge brokering and communication, payroll, travel and general administrative overheads. Total expenditure incurred in 2017-18 was **\$14,198,203**.

Revenue



Expenditure



- Project management activities
- Implementation contract activities
- Auspiced activities
- Research contract activities



Aerial view of Green island, Great Barrier Reef. Photo: Wayne Spencer

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