



Australian Government

Department of the Environment, Water, Heritage and the Arts



## Commonwealth Environment Research Facilities

### Marine and Tropical Sciences Research Facility





## Executive Summary

Most research facilities measure their success in terms of the number of scientific and technical publications they have produced. While publication by this means is an extremely important step in maintaining the credibility of scientific information, [the objectives of the Marine and Tropical Sciences Research Facility \(MTSRF\)](#)<sup>1</sup> are more accurately served using additional indicators of performance.

[The Reef and Rainforest Research Centre \(RRRC\)](#)<sup>2</sup> considers that the success of the MTSRF depends not only on the quantity and scientific credibility of the new information, but also its **impact on policy and practice**. In addition to representing and managing the consortium of over 300 scientists, 15 research providers and at least 38 end user organisations that comprises the MTSRF, the RRRC performs the role of synthesising and delivering MTSRF-generated information to end users, such that the MTSRF delivers the best possible return on investment. For more information about the need for and value of RRRC's activities in this regard, please see the section entitled "Statements from end users of MTSRF research."

*“ The success of the MTSRF model was apparent [at the 2009 MTSRF conference] in that partnerships between researchers and other stakeholders are demonstrating how Australia is better off by acquiring relevant knowledge for the management of marine and terrestrial resources. ”*

**Prof Michael Kingsford, Head of School**  
School of Marine and Tropical Biology JCU Newsletter Issue 6

Here we present brief descriptions of just some of the cases in which successful delivery of MTSRF-funded solution science to end users has already contributed to changes in policy and/or practice. Hyperlinks are provided wherever possible to enable readers to pursue tangible outputs and outcomes beyond this document.

Please note that this is a work in progress: at this stage the MTSRF has only been operating for three years of its four-year tenure. Accordingly, this should be considered a live document, which will be regularly updated as the MTSRF progresses. Interested readers should check for more recent updates via the RRRC website ([www.rrrc.org.au/](http://www.rrrc.org.au/)).

The very long list of technical and scientific reports and publications produced so far by members of the MTSRF consortium – including papers published in the highly-respected international journals *Science* and *Nature* – can be found in [Appendix 1](#).

### About the MTSRF

The Australian Government's \$40 million MTSRF is part of the Commonwealth Environment Research Facility (CERF) program. The MTSRF aims to increase the sustainability of management and use of north Queensland's key environmental assets – the Great Barrier Reef, Wet Tropics rainforests and the Torres Strait. Due to its size and complexity, the MTSRF is administered by the Reef and Rainforest Research Centre (RRRC), a north Queensland-based, non-profit company that represents the ~300 scientists, fifteen research providers and at least 38 end user organisations in the MTSRF consortium.

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<sup>1</sup> [www.rrrc.org.au/publications/downloads/Your-guide-to-the-MTSRF.pdf](http://www.rrrc.org.au/publications/downloads/Your-guide-to-the-MTSRF.pdf)

<sup>2</sup> [www.rrrc.org.au/publications/downloads/RRRC\\_Brochure.pdf](http://www.rrrc.org.au/publications/downloads/RRRC_Brochure.pdf)



# **Achievements of the Marine and Tropical Sciences Research Facility: Impacts on policy and practice**

September 2009





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## The Reef and Rainforest Research Centre – delivering science solutions for the tropics

The Australian Government's commitment to evidence-based policy means that the longstanding problem of publicly-funded, public-good research programs failing to inform public policy or practice needs to be addressed.

Encouragingly, this report contains many examples of MTSRF-funded science solutions being taken up by end users and impacting positively on policy and practice. What makes the MTSRF so successful in this regard?

In the MTSRF, DEWHA has conducted an innovative experiment in the management and delivery of applied research. Under the MTSRF model, an independent entity (the Reef and Rainforest Research Centre, or RRRC) performs project management, engagement, synthesis and delivery roles on behalf of a large interdisciplinary consortium of researchers and end users. The effectiveness of the RRRC in these roles is proving to be fundamental to the consortium's success in the provision of useful, timely information to end users.

*“Through the consortium of research providers and end users involved in the Marine and Tropical Sciences Research Facility (MTSRF), the Department of Environment, Heritage, Water and the Arts has successfully constructed a model for research delivery that is truly making a difference to the future... in Queensland and Australia.”*

**Mr Daniel Gschwind, Chief Executive Officer**  
Queensland Tourism Industry Council

As a startling example of the value of this innovative approach, RRRC's novel research project management system has achieved 0% slippage in the delivery of project milestones in Year 1, 3.7% slippage in Year 2 and 3.3% slippage in Year 3 of the MTSRF, despite the fact that slippage rates of ~20% are considered fairly normal for other established models of research project management in Australia. These efficiency gains speak for themselves.

The positive results of this local experiment in management of applied research are supported by recent international studies showing that sustained, strong engagement and targeted delivery significantly increases the likelihood of new knowledge actually being applied and informing policy and practice.<sup>1</sup> Ongoing refinements to the MTSRF/RRRC model of applied research management should permit the Australian Government to continue breaking ground in this field, and to increase the rate at which publicly-funded applied research programs successfully inform public policy and practice.



<sup>1</sup> Bielak, A. T., Holmes, J., Savgård, J., and Schaefer, K. (2009) *A comparison of European and North American approaches to the management and communication of environmental research*. Swedish Environmental Protection Agency Report 5958. 132 pp

## Consortium Partners

Sunfish  
Queensland Health  
CSIRO  
Queensland Seafood Industry Association  
Australian Centre for Tropical Freshwater Research  
World Wildlife Fund  
Australian Fisheries Management Authority  
University of New South Wales  
University of Melbourne  
Charter Fishers  
Southern Cross University  
Ports Corporation of Queensland  
University of Queensland  
Australian Defence Force Academy  
Tourism Tropical North Queensland  
FNQ ROC  
Biotropica  
Fish Collectors  
Commercial Fishers  
Alliance for Sustainable Tourism  
James Cook University  
Traditional Owners  
Queensland Department of Natural Resources and Water  
Terrain NRM Ltd  
Great Barrier Reef Marine Park Authority  
Australian Institute of Marine Science  
North Queensland Climate Alliance  
Reef Water Quality Partnerships  
Australian Maritime College  
Reef and Rainforest Research Centre  
Environmental Protection Agency  
Queensland Department of Primary Industries and Fisheries  
Girringun Aboriginal Corporation  
Surf Lifesaving Australia  
Torres Strait Regional Authority  
Central Queensland University  
Australian Museum  
Private Researchers  
Queensland Canegrowers Association  
Wet Tropics Management Authority  
University of Alberta  
Association of Marine Park Tourism Operators  
Great Barrier Reef Foundation  
Island Councils  
Department of Agriculture Forestry and Fishing  
Queensland Department of Main Roads  
Australian National University  
Griffith University  
Reef Check  
Powerlink



## Statements from end users of MTSRF research

*“ As the North Queensland tourism industry matures, there is increasing recognition of the need for research that can be used to improve the industry’s economic and environmental sustainability. However, our past experience has shown that conventional research agencies often do not deliver information or products that actually meet our needs. Furthermore, research institutions are generally not well set-up to engage with end users, including tourism operators. This leads to lost opportunities in applying research and diminishes the returns to the community from the research investment.*

*Through the consortium of research providers and end users involved in the Marine and Tropical Sciences Research Facility (MTSRF), the Department of Environment, Heritage, Water and the Arts has successfully constructed a model for research delivery that is truly making a difference to the future of tourism in Queensland and Australia. The Reef and Rainforest Research Centre – the independent, non-profit North Queensland-based company which delivers the MTSRF – is the most effective model that we have been involved in.”*

**Mr Daniel Gschwind, Chief Executive Officer**  
Queensland Tourism Industry Council

*“ The RRRC has ensured that research is focused, culturally sensitive and appropriate for the Torres Strait with management that is organised for delivery, synthesised and provides effective means of knowledge repatriation. This is essential in an environment which involves communities that have previously been very skeptical of researchers and the perception that they are knowledge-takers.*

*The Torres Strait Regional Authority holds strong support for the RRRC which as an organisation has proven that well managed research programs can have a positive impact on the Torres Strait communities and environment.”*

**Mr Damien Miley, Manager, Land and Sea Management Unit**  
Torres Strait Regional Authority (TSRA)

*“ AMPTO has been involved in research through the CRC Reef for many years and finds the working relationship we now have with the RRRC the best we have had with a research group. The responsiveness of the RRRC to our requests and the willingness to provide information back to the industry is unprecedented and good for the industry in general.*

*AMPTO has given and will continue to give the RRRC strong support and would consider the loss of the RRRC as a blow for the Industry’s ability to directly influence the type of research undertaken. AMPTO has informed the DEWHA that we consider the funding of the RRRC as a fundamental show of Federal support for the Industry’s future. AMPTO has also advised the DEWHA that there needs to be a smooth transition between the MTSRF and the new funds to prevent the loss of skilled researchers from the region.”*

**Mr Col McKenzie, Chief Executive Officer**  
Association for Marine Park Tourism Operators (AMPTO)









## Impact of the MTSRF on Policy and Practice

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One of the biggest end users of the MTSRF is the Australian Government, which has publicly committed to evidence-based policy. The Department of Environment, Heritage, Water and the Arts (DEWHA) faces the challenge of acquiring the relevant management and policy information that is needed in order to meet this commitment, and to achieve the outcomes outlined in the Department's Strategic Plan<sup>1</sup>:

- I. Conserving our natural assets (Caring for our Country)**
- II. Living and working sustainably**
- III. Protecting Antarctica**
- IV. Adapting to a future with less water**
- V. Protecting and enhancing Australia's culture and heritage**
- VI. Improving organizational effectiveness**

For ease of reading, the following discussion of some of the tangible outputs and outcomes of MTSRF activities (or RRRC activities on behalf of the MTSRF) to date is organised by DEWHA's information needs (I-VI). The other end users already benefiting from each product are specified in square brackets '[ ]'.

### I. Conserving our natural assets (Caring for our Country)

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*Outlined below are some of the ways in which the MTSRF-funded science is helping to conserve and protect Australia's tropical terrestrial and marine biodiversity and ecosystems. This is being achieved not just through delivery of targeted research, but by interpreting scientific information, supporting natural resource management (Caring for our Country), and assisting DEWHA in meeting their obligations to make assessments (EPBC), report on the State of the Environment, and establish and manage Commonwealth protected areas. While the spectacular natural assets of north Queensland – such as the Great Barrier Reef and Wet Tropics rainforests – are the focus of much MTSRF-funded research, many of the resulting methods and tools are transferable to comparable environments elsewhere in the region.*

#### MTSRF information contributes to GBRMPA's first Outlook Report

The Great Barrier Reef Marine Park Authority (GBRMPA) is responsible for the preparation of a Great Barrier Reef Outlook Report for federal parliament every five years. The primary aim of the Outlook Report is to provide a regular and reliable report on the management of the GBRMP, the overall condition of the ecosystem of the [GBR region](#)<sup>2</sup>, social and economic factors, as well as a risk-based assessment of the longer-term outlook for the GBR. Information derived from MTSRF-funded research has contributed substantially to the [first such Outlook Report](#)<sup>3</sup>. [GBRMPA, DEWHA, federal government]

#### The e-Atlas: A knowledge management system for Australia's Tropical Lands and Seas

Managing our tropical lands and seas to enhance their resilience, particularly in the face of growing threats posed by climate change, declining water quality and unsustainable use, is a significant scientific, policy and management challenge. Effective collation, synthesis, analysis and dissemination of credible climate change-related bio-physical and socio-economic information to policy makers, natural resource managers, scientists and the general public will be one of the keys

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1 DEWHA (2009) Strategic Plan: Directions to 2014. Available online at [www.environment.gov.au/about/publications/pubs/strategic-plan-2009.pdf](http://www.environment.gov.au/about/publications/pubs/strategic-plan-2009.pdf)

2 [www.reefed.edu.au/\\_data/assets/pdf\\_file/0009/18783/SDC2004120620Sept200420General20Reference.pdf](http://www.reefed.edu.au/_data/assets/pdf_file/0009/18783/SDC2004120620Sept200420General20Reference.pdf)

3 [www.gbrmpa.gov.au/corp\\_site/about\\_us/great\\_barrier\\_reef\\_outlook\\_report](http://www.gbrmpa.gov.au/corp_site/about_us/great_barrier_reef_outlook_report)

to successfully meeting this challenge. The MTSRF (with additional contributions from the Great Barrier Reef Marine Park Authority) is funding a substantial collaborative effort involving 15 research providers and many key end users to develop the [e-Atlas](#)<sup>1</sup>.

The e-Atlas is a new web-accessible integrated knowledge management system designed to provide a framework to facilitate effective use and sharing of information in order to enhance evidence-based decision making for effective management and long-term sustainable use of the Great Barrier Reef and its catchments, the Wet Tropics rainforest and Torres Strait. The e-Atlas is a portal providing access to new data and information handling, spatial mapping and analytical tools to collate, integrate, share and analyse the vast array of bio-physical and socio-economic required to manage these environmentally, economically and culturally valuable systems effectively.

Based entirely on open-source software, the e-Atlas uses internationally recognised standards that enable its content to be interrogated and delivered to GIS systems, particularly those within federal and state government departments and agencies. The e-Atlas currently holds a growing number of text pages and more than 600 maps derived from data contributed by nine different national, state and local institutions. These maps illustrate numerous characteristics of North Queensland's ecosystems, particularly patterns and hotspots of biodiversity and threats, facilitating the identification and improvement of understanding of the major risk and resilience factors influencing the MTSRF region, and their ecological, social and economic impacts; and enhances capacity to evaluate and implement effective policy and management responses to ensure the long-term sustainability of North Queensland's natural assets.

The e-Atlas is already the major knowledge and meta-data capture and delivery tool for the MTSRF program and has made a substantial contribution to the first [Outlook Report](#)<sup>2</sup> for the Great Barrier Reef. The e-Atlas is currently being trialed internally within the Great Barrier Reef Marine Park Authority (GBRMPA) as a no-cost GIS platform that provides all GBRMPA staff with the capacity to visualize and interrogate spatial information describing the Reef. Planning is underway to incorporate the e-Atlas into the Australian Government's [Caring for Our Country - Reef Rescue](#)<sup>3</sup> initiative as the major reporting tool for monitoring programs, providing the vital link that will enable the evaluation of progress towards improvements in reef condition. [GBRMPA, DEWHA, WTMA, NASA, DEEDI, ReefCheck, tourism industry, state governments, local councils]



*The e-Atlas is demonstrated for the Prime Minister, Mr Kevin Rudd, and Member for Leichhardt Mr Jim Turnour at Port Douglas, July 2008. Image courtesy RRRRC.*

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1 [www.e-atlas.org.au/](http://www.e-atlas.org.au/)

2 [www.gbrmpa.gov.au/corp\\_site/about\\_us/great\\_barrier\\_reef\\_outlook\\_report](http://www.gbrmpa.gov.au/corp_site/about_us/great_barrier_reef_outlook_report)

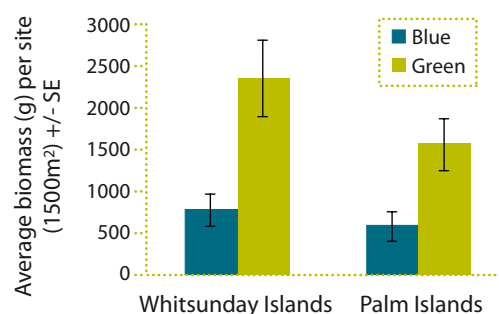
3 [www.nrm.gov.au/funding/2008/reef-rescue.html](http://www.nrm.gov.au/funding/2008/reef-rescue.html)

## MTSRF science informs management of the Coral Reef Fishfish Fishery

The MTSRF has funded researchers from JCU to work with previously unused data from the CRC Reef's [Effects of Line Fishing \(ELF\) experiment](#)<sup>1</sup> to uncover aspects of the life histories of targeted fish that are important for sustainable management of Queensland's Coral Reef Finfish Fishery. The results are relevant to determining minimum and maximum sizes and bag limits appropriate for sustainable fishing of each species, and are being provided to DEEDI's Reef Scientific Advisory Group, which advises DEEDI's Reef Management Advisory Committee. This work has already led to changes in the [timing and temporal extent of spawning closures](#)<sup>2</sup> for the Coral Reef Finfish Fishery. [fishing industry, DEEDI, GBRMPA, Queensland government, DEWHA]

## No-take zones are effective conservation tools for targeted fish species

MTSRF-funded studies by JCU and AIMS have revealed the 2004 GBR rezoning, which resulted in 33% of the marine park allocated as no-take zones, has been effective for coral trout, a species highly prized by both recreational and commercial fishers. Numbers of coral trout have increased by 31-75% on the majority of reefs that have been closed to fishing for as little as 1.5-2 years. This unequivocal demonstration of the effectiveness of green (no-take) zones as management tools for targeted fish species has been of great interest to fishers, scientists and managers in Queensland, nationally and internationally. [GBRMPA, DEWHA, International]



*Green (no-take) zones harbour significantly greater biomass of coral trout than blue (fishing) zones.*

## Analysis of the effectiveness of the GBRMP rezoning for ecosystem protection

Following the 2004 rezoning of the Great Barrier Reef Marine Park, much of the public attention focused on the protection of coral habitats. However, MTSRF-funded researchers from CSIRO and AIMS have shown that deep regions of the Park have also benefited. In a study of around 840 seabed species, they found that prior to the rezoning, only 160 species had greater than 20% of their predicted population in highly protected areas. After the rezoning all 840 species had greater than 20% of their predicted population in highly protected areas. This information demonstrated that the new zoning achieved the targeted 20% protection level for seabed species. This is a valuable technique for use in the development of other marine protected areas. [GBRMPA, DEWHA, NGOs, International]

## Early warning system for crown-of-thorns starfish outbreaks

Crown-of-Thorns starfish (COTS) outbreaks can devastate the corals of the Great Barrier Reef (GBR). MTSRF-funded researchers at AIMS have developed and implemented an early warning system which is used by the marine tourism industry to alert operators of an imminent COTS outbreak and to prepare eradication programs for the reefs most frequented by tourists. In late February 2009 a survey team from the MTSRF-funded Reef Check program responded to tourism industry concerns of COTS at Moore Reef, and found that starfish numbers remained low. The MTSRF also funds AIMS to carry out COTS surveys across the entire GBR. Most recent surveys show starfish abundances are at a 20-year low. In addition, surveys conducted over the last 15 years show that no-take green zones are less vulnerable to COTS outbreaks, with the frequency of outbreaks on reefs open to fishing 3.75 times greater than on no-take reefs. The Australian and Queensland Governments support the COTS eradication program through supplementary funding. [Marine tourism industry, DEWHA, GBRMPA]

1 [www.reef.crc.org.au/research/fishing\\_fisheries/elf.html](http://www.reef.crc.org.au/research/fishing_fisheries/elf.html)

2 [www.abc.net.au/rural/news/content/200811/s2417568.htm](http://www.abc.net.au/rural/news/content/200811/s2417568.htm)

## Value of sharks and other marine wildlife to tourism industry

MTSRF-funded researchers from JCU evaluated the tourism value of key marine species and found that marine turtles, sharks and Maori wrasse, potato cod, moray eels and leafy scorpion fish rated the highest. Tourists related the presence of these species to the health and environmental quality of the Great Barrier Reef. The research also demonstrated that an average visitor spends approximately \$328 per day and approximately \$1737 per visit, while those who go diving spend approximately \$6000 in the region. Preliminary estimates of the per-visitor regional expenditure that is attributable to each marine species are as follows:

Marine turtles	\$1360
Sharks	\$1375
Fishes	\$1354
Sea Birds	\$589
Other wildlife	\$643

The presence of these wildlife species – at least some of which are threatened – underpins the marine tourism industry in the Great Barrier Reef. This information is helping the tourism industry quantify the value of such environmental assets to their businesses. [DEWHA, marine tourism industry, GBRMPA]

## Stakeholder perceptions of the 2004 rezoning of the GBRMP

The attitudes and perceptions of recreational fishers to the 2004 rezoning plan were investigated by MTSRF-funded researchers from JCU to evaluate the success of the community consultation process. Encouragingly, most recreational fishers thought the rezoning was a good idea, with almost 60% supporting the actual zoning plan that was implemented in 2004. However the majority of recreational fishers felt that they were not treated fairly compared to other groups during the rezoning process, and a third of those surveyed felt that the concerns of recreational fishers hadn't been taken seriously. This research highlights the importance of maintaining a strong productive relationship between resource managers and stakeholders, in this case the recreational fishing community. These lessons can be applied throughout Australia when developing marine protected areas and managing World Heritage properties. In addition, these results have been transmitted to recreational fishing lobby groups such as CapReef. [GBRMPA, DEEDI, CapReef, DEWHA, International]



*MTSRF-funded research shows that most recreational fishers support the use of marine protected areas for biodiversity conservation in the Great Barrier Reef World Heritage Area. Image courtesy of David Souter/RRRC.*



## Delivering the latest research into the impacts of pesticides on the GBR

After citing [RRRC's Water Quality Synthesis Report](#)<sup>1</sup> in a [media release](#)<sup>2</sup> discussing the impacts of pesticide residues on human health, the Australian Pesticides and Veterinary Medicines Authority (APVMA) queried WWF on their comments that pesticides were a risk to the Great Barrier Reef. In response, RRRC synthesised the latest MTSRF results relevant to the impact of pesticides and herbicides on the Great Barrier Reef into a draft science summary that was provided to WWF for comment on 2 Jun 09. This draft summary was also provided to the Queensland Minister for Sustainability and Queensland Minister for Primary Industries, Fisheries and Rural and Regional Queensland in Aug 09, and was requested by the Australian Parliamentary Library in Jun 09. The RRRC is currently leading an inter-agency writing group preparing a detailed report synthesising the state of current scientific knowledge about the impact of pesticides on the ecosystems and resilience of the Great Barrier Reef. [WWF, GBRMPA, DEWHA, APVMA, State govt]

## The impacts of climate change on the world's largest green turtle population

The northern part of the Great Barrier Reef is the world's most significant remaining breeding area for green turtles (a species classified as "Endangered" by the IUCN). MTSRF-funded researchers at JCU have measured a rapid decline in breeding success for green turtles in the region, and are working to assess whether climate change is responsible. Knowledge gained is being delivered to local Torres Strait communities via training programs for Indigenous rangers, simultaneously building the capacity for field monitoring of turtles, which are an important food and cultural resource for Islanders. The Queensland Minister for Climate Change and Sustainability, The Hon. Kate Jones, has publicly acknowledged the value of this study, indicating that such research led to increased capacity for management. [DEWHA, GBRMPA, TSRA, DERM]

*The MTSRF funds JCU PhD student, Ms Mariana Fuentes, to investigate the likely impacts of climate change on sea turtles and train Indigenous rangers in monitoring of turtle nesting success. Image courtesy of Mariana Fuentes.*



## Corals have some genetic capacity to adapt to increasing sea surface temperatures

MTSRF-funded research conducted by AIMS and JCU has demonstrated that corals and their symbiotic zooxanthellae retain some inherent capacity to evolve to cope with increasing sea temperatures occurring due to climate change. Current research efforts are focused on identifying:

- The genes involved in thermal stress responses;
- The individual colonies that possess those gene variants that increase tolerance to warmer seas; and
- The specific areas of the GBR that are likely to be more resilient as a result.

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<sup>1</sup> [www.rrrc.org.au/publications/wq\\_synthesis.html](http://www.rrrc.org.au/publications/wq_synthesis.html)

<sup>2</sup> [www.apvma.gov.au/media/mr0905.shtml](http://www.apvma.gov.au/media/mr0905.shtml)

This information can be transferred into direct management actions by the GBRMPA by ensuring that naturally resilient areas of the GBR are afforded adequate protection as part of GBRMPA's climate response plan. This method for spatial mapping thermal resilience of reefs will be transferable to other marine planning activities elsewhere involving coral reefs. [GBRMPA, marine tourism industry, DEWHA, International]

### Spatial risk assessment for coastal seagrass communities

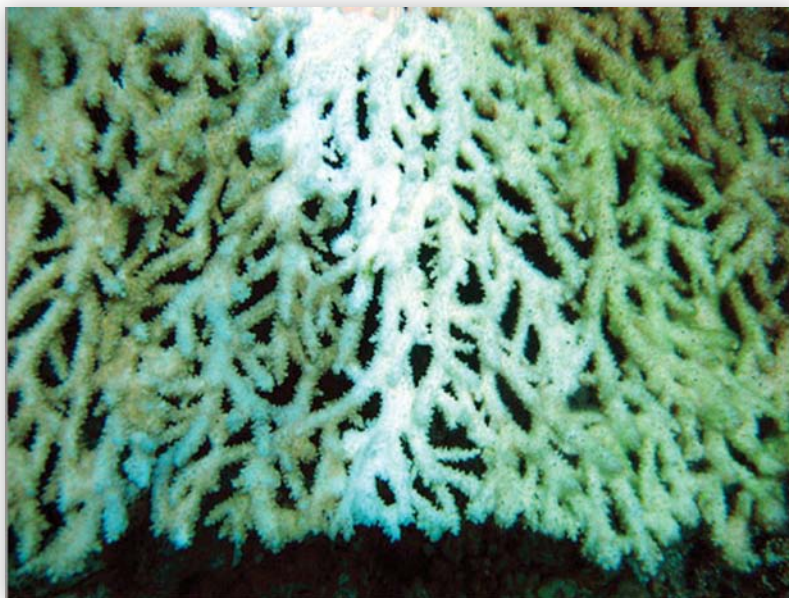
MTSRF-funded research examining the risks posed to coastal seagrass communities from a broad range of threats including trawling, coastal development, dredging and pollution, indicate that shallow inshore areas of Cleveland Bay, Hinchinbrook Channel and Trinity Inlet near Cairns are 'hotspots' where there is a high likelihood that seagrass communities being exposed to multiple, high impact, anthropogenic hazards. This information is being used by QDPI and GBRMPA for seagrass management and has significant implications for the conservation and management of dugong and turtle populations in these regions. [QDPI, GBRMPA, DEWHA, International]

### Understanding and predicting outbreaks of coral disease

There has been increasing concern worldwide about the potential for outbreaks of coral disease to reduce reef resilience. MTSRF-funded research by JCU and AIMS has investigated the links between the prevalence of the coral disease 'white syndrome' and thermal anomalies. Results indicate that the incidence of disease is greater:

- during high summer temperature anomalies that follow warmer than average winters;
- during summers that follow winters characterised by the absence of a cold snap; and
- when the density of acroporid coral hosts is high, facilitating the spread of the disease.

This information is contributing to the development of GBRMPA's guidelines for managing coral disease, and is also being used to develop a model of coral disease incidence and a web-based tool for predicting disease outbreaks, which should be publicly available online via the [e-Atlas](#)<sup>1</sup> by mid-2009. The development of this web-based predictive tool involves collaboration with another CERF hub ([AEDA](#)<sup>2</sup>) and co-funding from GBRMPA's Climate Change Group. Latest trials indicate that this tool can also reliably predict outbreaks on reefs in other regions and hence could be a very useful mechanism for monitoring and reporting on disease incidence in remote, tropical Commonwealth-managed marine protected areas such as Ashmore and Cartier Reefs. [GBRMPA, marine tourism, DEWHA, International]

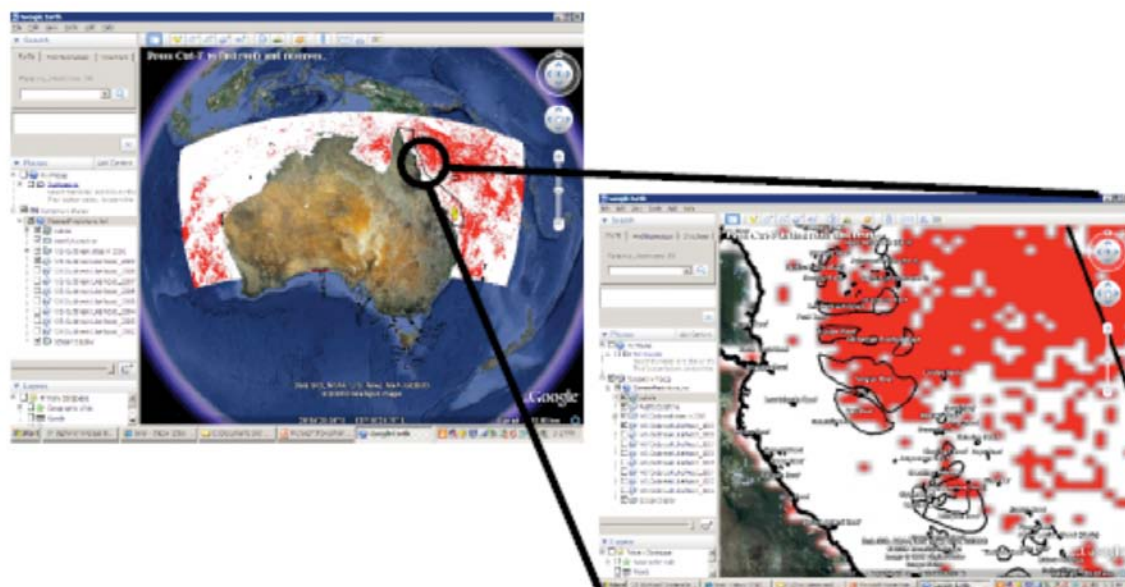


*Detail of plate Acropora coral showing symptoms of coral disease: healthy tissue on the left, a moving "front" of dead white coral skeleton in the middle, and dead coral becoming colonized by algae on the right. Image courtesy of Suzanne Long / WA DEC*

1 [www.e-atlas.org.au/](http://www.e-atlas.org.au/)

2 [www.aeda.edu.au/](http://www.aeda.edu.au/)





*Screen grab from the new predictive tool for coral disease (white syndrome) outbreaks. It is interactive through the newest version of Google Earth, allowing users to search for and store locations, export images as well as toggle between years. Reefs, islands and Commonwealth Marine Reserves are labelled to increase interpretability.*

## **Corals afflicted by poor water quality are more likely to bleach**

MTSRF-funded researchers from AIMS have taken a scenario modeling approach to integrating the combined effects of climate change and water quality on reef health. While the science clearly demonstrates that the sediments, nutrients and other pollutants flowing out of our rivers are affecting reef health, this modeling potentially illustrates the strong link between water quality and coral reef health. The model predicts that corals affected by poor water quality:

- Are two to four times more likely to suffer bleaching (from temperature increase) than reefs bathed in good quality water;
- Bleach at lower temperatures than corals bathed in good water quality; and
- Are more likely to suffer mortality following a bleaching event.

Therefore, management actions aimed at improving water quality will improve the resilience of the GBR to bleaching. Alongside global strategies aimed at reducing the rate of global warming, local water quality improvements could considerably delay, and possibly even prevent, extensive coral mortality due to bleaching on the GBR. These modeling results will be experimentally tested in a series of trials to be conducted by AIMS commencing in September 2009. This information will help inform and validate the Caring for our Country – Reef Rescue program. [DEWHA, GBRMPA, Queensland Government]





*The Queensland Premier, The Hon. Anna Bligh, is briefed on the relationship between water quality and reef health by Sheriden Morris, the Managing Director of the Reef and Rainforest Research Centre, 27 January 2009. Image courtesy Suzanne Long/RRRC.*

## **Water quality hazard mapping for the Caring for our Country - Reef Rescue Program multi-criteria analysis**

MTSRF-funded researchers from AIMS, JCU, UQ and CSIRO have significantly contributed to the development of a water quality hazard map to inform a Multi-Criteria Analysis for the Australian Government's Caring for our Country - Reef Rescue Program. The hazard map synthesises a significant amount of MTSRF-funded research to develop a statistically robust analysis of the source transport and impact of sediments, nutrient and pesticides from the catchment to the GBR. In this way MTSRF-derived information is making a strong contribution to the likelihood of success of the Caring for our Country – Reef Rescue program. [DEWHA, GBRMPA, Queensland Government]

## **Water quality indicators are being used in the Reef Rescue Marine Monitoring Program**

The robust, useful marine water quality indicators (including biological indicators such as biofilms) that have been developed by MTSRF-funded researchers at AIMS are now being put to work by the Australian Government's Reef Rescue Marine Monitoring Program. This comprises a considerable enhancement of the suite of physical and chemical water quality parameters available for the monitoring program. [DEWHA, GBRMPA, Queensland Government]

## **Landholder attitudes toward environmental management for improved water quality**

MTSRF-funded social science surveys have enabled development of [a comprehensive set of profiles \(typology\) of landholders<sup>1</sup>](#) in relation to their NRM practices on private land in the Wet Tropics region. The rationale for profiling land managers was to provide means for those designing and implementing policies and programs to better target these to improve management of natural resources in rural areas. Among other findings, this study has shown that [landholders who actively seek information about their environmental management practices tend to be more profitable<sup>2</sup>](#). This understanding is facilitating effective design and delivery of NRM and rural development programs – such as the Caring for our Country Reef Rescue Program – by public agencies. [WTMA, Terrain NRM Ltd, NGOs, state and federal governments]

1 [www.rrrc.org.au/publications/downloads/494-UQ-Entage-N-2009-Landholders-Market-Segmentation-Study.pdf](http://www.rrrc.org.au/publications/downloads/494-UQ-Entage-N-2009-Landholders-Market-Segmentation-Study.pdf)

2 [www.rrrc.org.au/mediadirectory/downloads/knowledge\\_is\\_profit\\_200409.pdf](http://www.rrrc.org.au/mediadirectory/downloads/knowledge_is_profit_200409.pdf)



## Coordinated management of the Reef Rescue Marine Monitoring Program

RRRC's role in coordinating, refining and managing the Australian Government's [Reef Rescue Marine Monitoring Program](#)<sup>1</sup> (RRMMP) has resulted in a highly coordinated ambient and event response program monitoring water quality throughout the Great Barrier Reef region, augmented by remote sensing. Funded by Caring for our Country through the Great Barrier Reef Marine Park Authority, the RRMMP is already beginning to provide information on the effectiveness of efforts to reduce agricultural runoff to the Great Barrier Reef, including the Reef Rescue Program. The RRRMMP's first draft annual report is currently under review by GBRMPA. [DEWHA, GBRMPA, Queensland Government]

## Cost-effectiveness of different land use management practices for water quality improvement

Cost-benefit analysis of changes in land use practices to improve water quality entering the GBR has been undertaken by MTSRF-funded researchers from CSIRO. This work shows that improved practices need not increase costs or decrease profits for landholders. It also shows that changes to land management practices alone may not be sufficient to achieve the improvements in water quality need to restore the inshore regions of the GBR. Actual changes in land use adjacent for high risk areas may be required. This information will be used in the Caring for our Country - Reef Rescue Multi Criteria Analysis. [DEWHA, GBRMPA]

## Refining hydrodynamic models for the calculation of total flood loads

MTSRF-funded researchers from CSIRO have shown that a considerable portion of water quality pollutants come from the flood plain rather than the river system during flood events. Since most of the flood discharge is not captured by the river gauges, the assessment of sediment, nutrients and pollutants entering the marine environment has been underestimated. The capacity to measure the contribution of pollutants from the flood plain is essential to measuring the success of the land management changes funded through Caring for our Country - Reef Rescue. [state and federal governments, agricultural industry]



*Flood plume (brown) extending out from the Russell River to the offshore islands of the Frankland Group, inshore Great Barrier Reef, 27 January 2009. Image courtesy of Hayley Gorsuch/RRRC.*

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<sup>1</sup> [www.rrrc.org.au/mmp/index.html](http://www.rrrc.org.au/mmp/index.html)





## **Freshwater indicators for use in the Queensland water quality monitoring program**

Physical, chemical and biological indicators of poor water quality in tropical freshwater systems have been developed by MTSRF-funded researchers at JCU and Griffith University. This allows a rapid assessment of the ecological health of tropical streams and rivers and will be used by land holders and NRM bodies to measure the impact of poor water quality on the freshwater system of North Queensland. [DEWHA, GBRMPA, Queensland Government]

## **MTSRF-funded research contributes to the development of draft Water Quality Guidelines for the GBR**

The MTSRF has funded AIMS to perform statistical analyses of water quality indicators and thresholds of concern to facilitate the development of guideline water quality values for the Great Barrier Reef. The areas of the GBR ecosystem at high risk due to poor water quality have been identified. This information will be used by the Caring for our Country - Reef Rescue Program, and has already been used by GBRMPA to inform [draft water quality guidelines for the Reef](#)<sup>1</sup>. [DEWHA, GBRMPA, rural industries]

## **Contributing to EPBC assessments and statutory planning processes**

MTSRF-funded researchers have helped to identify Queensland regional ecosystems relevant to EPBC Act-listed threatened species by collating distribution data for all EPBC-listed species within the area of study, then assigning each point to a particular regional ecosystem habitat type. Predictive modelling based on key resources and environmental correlates continues for vertebrate species, to provide better predictive power in highlighting key areas for protective management, and to search for as-yet undocumented populations. In addition, MTSRF-funded researchers have developed more general, practical recommendations about managing and remediating the impacts of urbanisation and peri-urban and rural development on tropical ecosystems. Elements of the resulting information and mapping are currently being used for EPBC assessments in the region. Many associated MTSRF projects have contributed information to Queensland's statutory planning processes, as well as the FNQ Regional Plan 2031. [local government, Queensland Government, NRM bodies, WTMA]

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<sup>1</sup> [www.gbrmpa.gov.au/corp\\_site/key\\_issues/water\\_quality/draft\\_water\\_quality\\_guidelines](http://www.gbrmpa.gov.au/corp_site/key_issues/water_quality/draft_water_quality_guidelines)

## Increasing the effectiveness of cassowary conservation at Mission Beach

MTSRF-funded researchers from CSIRO have been testing ways of increasing the effectiveness of natural resource management and conservation efforts in ecologically valuable local government areas, such as the Mission Beach region. Based on an adaptive management planning framework, the method aims for an effective implementation by integrating economic and ecological systems, and is aiding DEWHA in its EPBC assessments processes in the Mission Beach area. This work has been instrumental in unifying local community opinion about cassowary conservation, and identifying vital cassowary habitat threatened by development.

The resulting draft [Mission Beach Habitat Network Action Plan](#)<sup>1</sup> was released for public consultation by Terrain NRM on 8 Aug 2009. Other MTSRF-funded scientists have developed a robust method for quantitative assessment of cassowary populations (faecal DNA analysis) which is engaging the community in sample collection and ultimately could be used to monitor the effectiveness of cassowary conservation efforts. Most recently, RRRC staff and MTSRF scientists have made submissions to the [draft EPBC Act Policy Statement](#)<sup>2</sup> on cassowary conservation. According to WTMA, a welcome if indirect consequence of the recent MTSRF research focus on the problems of cassowaries around Mission Beach has been an increase in community awareness and concern for the birds' welfare. [WTMA, DEWHA, Terrain NRM, Queensland Government departments, local councils]

## Development and implementation of a recovery plan for the endangered spectacled flying fox

The spectacled flying fox (*Pteropus conspicillatus*) is listed under the EPBC Act as vulnerable to extinction, and causes regular management headaches in far north Queensland due to its habit of roosting during the day in noisy "camps" of thousands of individuals, sometimes in [suburban areas](#)<sup>3</sup>. MTSRF-funded researchers from CSIRO have contributed significantly to the development of a science-based National Recovery Plan for these bats. These researchers are regularly consulted by Cairns Regional Council about management of flying fox camps, and the researchers' survey data, as well as a new method for assessing status and trends in this species, is being used by DERM as part of their monitoring program. In addition, these data were used by consultants performing probable risk assessments for Cairns Airport, which has led to increased safety in aircraft operations through changes in operating procedures. [QPWS, WTMA, Terrain NRM Ltd, local councils, NGOs, Cairns Airport]



1 [www.terrain.org.au/missionbeach](http://www.terrain.org.au/missionbeach)

2 [www.environment.gov.au/epbc/publications/casuarius-casuarius-johnsonii.html](http://www.environment.gov.au/epbc/publications/casuarius-casuarius-johnsonii.html)

3 [www.cairns.com.au/article/2009/01/27/25345\\_local-news.html](http://www.cairns.com.au/article/2009/01/27/25345_local-news.html)



## II. Living and working sustainably

*The overarching strategic goal of the MTSRF is to increase the sustainability of management and use of north Queensland's environmental assets, through funding and delivery of solution science. This fits well with DEWHA's stated objective of working towards environmentally sustainable communities and industries, despite the challenges of climate change. Some of the improvements in sustainability that have already been achieved through the RRRC and the MTSRF are documented below.*

### Calculating carbon sequestration rates for revegetated rainforest faster and more easily

MTSRF-funded researchers from Griffith University have developed a rapid assessment protocol that enables non-experts to estimate the quantity of carbon fixed in monoculture timber plantations, mixed species timber plantations and ecological restoration plantings. Application of this method in the Wet Tropics shows that replanted rainforest in north east Australia can accumulate relatively high amounts of above-ground biomass - and hence carbon - within one to two decades of establishment, compared to monoculture plantations, and that rapid assessment protocols can be used to obtain reasonable estimates of above-ground biomass for carbon accounting purposes. This method, which has been specifically designed to be compatible with the Australian Government's National Carbon Accounting System, is currently undergoing international peer review. [WTMA, state and federal governments, NGOs]

### Development of the latest and most up-to-date climate change projections for north Queensland

Understanding how climatic variables, such as rainfall and temperature, will change in future is critical to managing the impacts of climate change on the environments, industries and communities of north Queensland. MTSRF-funded researchers from CSIRO have developed models that show annual temperature for the Wet Tropics rainforests is projected to increase between 0.5 and 1.4°C by 2030, dry seasons will be drier and wet seasons will be slightly wetter. The projected increase in severity of cyclones and the increase in sea level means that storm surges similar to the one that inundated many coastal areas of north Queensland on 12 January 2009 will become more regular events.



This information has been provided by RRRC in a [submission<sup>1</sup>](#) to the Parliamentary Standing Committee on Climate Change, it has been used by the Queensland Climate Change Centre for Excellence in preparing its regional north Queensland assessments, was included in [a recent film<sup>2</sup>](#) made by the UN University about the impacts of climate change on Indigenous communities, and has been included in numerous RRRC delivery documents and presentations. The Great Barrier Reef Tourism Climate Change Action Strategy 2009-2012 cites the results of several MTSRF-funded research projects, and individual tourism businesses – for example the Skyrail Rainforest Cableway - are beginning to take these projections into account when making long-term plans for infrastructure replacement. On 21 July 2009 RRRC chaired and facilitated a technical workshop in Port Douglas that will guide future climate modeling research for tropical Australia [Federal and State governments, local councils].

*Don Whap poses on Victoria Parade on low-lying Thursday Island, Torres Strait, during the tidal inundation on 12 January 2009. Rising sea levels will have enormous consequences for*

*the viability of many Torres Strait communities. Image courtesy of Michael Koppman.*

1 [www.apf.gov.au/house/committee/ccwea/coastalzone/subs/sub030.pdf](http://www.apf.gov.au/house/committee/ccwea/coastalzone/subs/sub030.pdf)

2 [ourworld.unu.edu/en/2009/01/19/sea-level-rise-in-kowanyama/](http://ourworld.unu.edu/en/2009/01/19/sea-level-rise-in-kowanyama/)

## Tropical forests as carbon sinks or sources?

While rainforests are currently considered carbon sinks, MTSRF-funded researchers from CSIRO have found some evidence that this may no longer be the case under future climate projections for north Queensland. Due to the potential importance of this finding in the context of a possible global carbon trading scheme, these results are currently undergoing stringent international scientific review, including presentation at the global Climate Change Conference in Copenhagen in March 2009, and have attracted considerable international media attention. [Federal and State Governments, WTMA]

*The MTSRF funds several research projects based at James Cook University's Australian Canopy Crane<sup>1</sup> Research Facility investigating the impacts of climate change on rainforests. Image courtesy of Suzanne Long / RTRC.*



## Understanding and managing the impacts of climate change on rainforest ecosystems

The Wet Tropics is predicted to become hotter, drier and more seasonal as the climate changes, which will have profound consequences for rainforest ecosystems and the species that comprise them. MTSRF-funded computer modelling in the lab of Prof Stephen Williams at JCU predicts that climate change will cause significant shrinking of distribution, and potentially extinction, for more than seventy Wet Tropics animal species, including lemuroid possums, which are considered amongst the most susceptible. Complementary field surveys by the same researchers have confirmed striking changes in abundance and distribution of the white lemuroid possum, which until very recently had not been seen for three years in an area in which it was previously quite common. The most recent survey in March 2009 discovered just three individuals. This story has drawn significant regional, national and international media attention to the current and future impacts of climate change on rainforests.


Ongoing MTSRF-funded research by this team is aiming to identify potential climate refugia within the region, thereby enabling more effective management of Wet Tropics fauna despite climate change. WTMA has reported these results to the State and Commonwealth in its [2008/9 Annual Report<sup>2</sup>](#), and regularly uses the findings to strengthen applications for extra funding for



*The white lemuroid possum, a Wet Tropics endemic which has been identified as being highly vulnerable to extinction due to climate change. Image courtesy of Michael Trenerry / EPA*

1 [www.jcu.edu.au/canopycrane/](http://www.jcu.edu.au/canopycrane/)

2 [www.wettropics.gov.au/media/med\\_annual.html](http://www.wettropics.gov.au/media/med_annual.html)



climate change management. Discussing the value of this project in their MTSRF Pathway to Impact report, WTMA's management team wrote "...this research is important for WTMA. Being able to identify high-risk areas and species helps us prioritise management investment into potential adaptation responses." WTMA is now working closely with the researchers and QPWS to train rangers in the methods needed to regularly and robustly monitor changes in distributions of arboreal mammals in the region. In addition, rainforest tourism businesses are beginning to use the outputs of this work in developing interpretive and educational materials for visitors about trends in ecosystem condition and the ways in which the rainforest responds to change. [rainforest tourism businesses, WTMA, DEWHA, QPWS, general public]

## Best practice guidelines for road infrastructure in rainforest habitats

These guidelines were developed by MTSRF-funded researchers at JCU for road development in sensitive ecosystems. They have been used by the Queensland Main Roads Department and environmental consultants working in the Wet Tropics. The document comprises two volumes: a succinct guidelines document with illustrations (which is currently under review at DMR) and a large [reference science background document](#)<sup>1</sup> on rainforest ecology in the region. WTMA considers these results when providing advice to agencies (such as Main Roads, Ergon and DEWHA) about infrastructure design and developments in the Wet Tropics region, for example during the planning process for the widening of the Kuranda Range Road. WTMA has demonstrated its ongoing interest in the project by providing a small amount of additional funding to extend the study of the effectiveness of canopy bridges, and the expertise of this team of MTSRF researchers was recently called upon by authorities in south-east Queensland seeking options to decrease wildlife mortality on Compton Road. [DMR, WTMA, Terrain NRM Ltd, NGOs]



*A vertebrate species endemic to the Wet Tropics, the Herbert River Ringtail possum, photographed using a specially designed canopy rope bridge to cross the Palmerston Highway at night. Image courtesy of Miriam Goosem et al.*

## Predicting and tracking dispersal of invasive weeds

MTSRF-funded researchers from CSIRO have developed a simple, but very effective, way to predict the dispersion of weeds or invasive species in tropical landscapes. We now have a way of mapping the potential geographical spread following an accidental introduction of an invasive weed. Engagement between these researchers and far north Queensland councils (through FNQ ROC) has contributed to a strong cultural shift towards a more ecologically efficient and realistic approach to weed management. The researchers are currently engaging closely with local councils and NRM bodies to help coordinate and assess weed mapping efforts across local jurisdictions, and to adapt the method to the specific needs of each, enabling them to rapidly and cost-effectively target their control actions. In addition, Biosecurity Queensland has incorporated MTSRF-funded research results into their weed and pest eradication strategies, and also collects field data to contribute to further research. The consequence of this close relationship is immediate uptake of ideas and strategies for weed and pest control. Biosecurity Queensland requested that these MTSRF-funded researchers work closely with them in the development of their strategic plan for [research and management](#)<sup>2</sup>, which has led to several collaborative projects including current modeling to develop a tool that determines the most efficient search and destroy strategies for different pests and landscapes. [DERM, local councils and NRM bodies, Biosecurity Qld]

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1 [www.rrrc.org.au/publications/downloads/493-JCU-Goosem-M-et-al-2008-Overpass-evaluation-of-effectiveness.pdf](http://www.rrrc.org.au/publications/downloads/493-JCU-Goosem-M-et-al-2008-Overpass-evaluation-of-effectiveness.pdf)

2 [www.rrrc.org.au/publications/downloads/262-CSIRO-2007-Poon-et-al-Research-needs-for-invasive-species.pdf](http://www.rrrc.org.au/publications/downloads/262-CSIRO-2007-Poon-et-al-Research-needs-for-invasive-species.pdf)



## Development of an interactive biodiversity mapping platform

A computer-based mapping geodatabase has been developed to display spatial biodiversity data and identify priority areas for habitat protection and restoration. Already integrating with the [e-Atlas<sup>1</sup>](#), the interactive biodiversity mapping platform utilising ArcGIS with the CommunityViz extension is currently under development and refinement, both to display biodiversity spatial data, and to identify priority areas for habitat protection and restoration. This computer based mapping and geodatabase facilitates analysis and interpretation of complex inter-related biodiversity, threat, condition, protection and opportunity attributes across the study region. It has practical value for planning through interpretation of options under different future threats and can be used to monitor change in habitat and biodiversity values over time. The geodatabase is already functional and is being developed to ensure it will be available in perpetuity and continually updated with new information. [local and Queensland governments, NRM bodies, DEWHA, WTMA]

## Increasing sustainability for Queensland's sharks

MTSRF-funded research has led directly to improved management arrangements for sharks in Queensland's commercial inshore fisheries. The sustainability of inshore fishing, one of the most important commercial and recreational activities in inshore waters of the Great Barrier Reef, has been poorly understood in the past. The MTSRF-funded observer program has now generated the best available descriptions of shark catches in the inshore commercial net fishery. MTSRF-funded researchers from JCU and the DEEDI examined historical use of inshore species and determined that sharks comprise 35% of the total inshore commercial fishery harvest in the GBRWHA, nearly double the contribution to take of any other fish group. Of the sharks caught, 70% come from only four species, including the scalloped hammerhead shark which has recently been [categorised by the IUCN<sup>2</sup>](#) as "near-threatened".

Work is continuing to improve knowledge of the life/reproductive histories of the sharks caught, their susceptibility to commercial fishing and the ecological impact of apex predator removal, which are essential components of an effective risk assessment for sharks in the GBR. Results from this project have been delivered via briefings to DEEDI's Shark Working Group, Reef Management Advisory Committee and Reef Scientific Advisory Group, as well as GBRMPA's Fisheries Resource Advisory Committee, leading to [significant changes in fishery regulations<sup>3</sup>](#) effective on 1 March 09 and 1 July 09. The maximum size limit for line-caught sharks is now 1.5 m, and new fixed net sizes have been



established based on MTSRF-funded work. Bag limits have been set for sharks that have been shown to be especially vulnerable to overfishing (for example, there is now a limit of five whitespot guitarfish per boat in the inshore fishery). These MTSRF-generated results are now being used by the Scientific Advisory Group as they set future research priorities. In addition, Minister Garrett's [Independent Review Panel for the East Coast Inshore Finfish Fishery<sup>4</sup>](#) considered these results in making their total allowable shark catch recommendation of 600 tonnes per year (previously 950 tonnes). [DEEDI, federal government, NGOs]

*MTSRF Scholarship Student Mr Andrew Chin (JCU) releases a tagged hammerhead shark as part of his research project to increase understanding of the impacts of inshore fisheries on shark populations in north Queensland. Image courtesy of Andrew Chin/JCU.*

1 [www.e-atlas.org.au/](http://www.e-atlas.org.au/)

2 [www.iucnredlist.org/details/39385](http://www.iucnredlist.org/details/39385)

3 [www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/30\\_14437\\_ENA\\_HTML.htm](http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/30_14437_ENA_HTML.htm)

4 [www.environment.gov.au/coasts/fisheries/qld/east-coast-finfish/pubs/east-coast-finfish-review.pdf](http://www.environment.gov.au/coasts/fisheries/qld/east-coast-finfish/pubs/east-coast-finfish-review.pdf)

## Contributing to studies of the economic impact of coral bleaching

Both the RRRC and the MTSRF were acknowledged in the Great Barrier Reef Foundation's study entitled [Valuing the effects of Great Barrier Reef Bleaching](#)<sup>1</sup>, which was released in August 2009. This study by Oxford Economics relied heavily on MTSRF data and scientific support to inform detailed modelling of tourism recreational benefits attributable to a healthy unbleached reef. The conclusions of this study – that the loss of the Reef through climate change-induced bleaching would cost the Australian economy some \$37 billion - attracted considerable media attention and debate throughout Queensland and internationally eg Dr Suzanne Long from RRRC commented in multiple Queensland television news broadcasts. [GBRF, NGOs, state govt, DEWHA, DCC, general public]

## Collaborative, multi-agency response to assessing reef damage due to Cyclone Hamish and wet season flooding

In response to industry, government and general public concerns about the damage inflicted by wet season flooding and Cyclone Hamish on the southern Great Barrier Reef, GBRMPA and AIMS joined forces to survey affected areas, using funding supplied through the MTSRF. The results are to be publicly released at a multi-agency press conference on 22 August 2009. [DEWHA, GBRMPA, DERM, marine tourism, commercial fishing industry]



*Cyclone Hamish menacing the southern Great Barrier Reef, 8 March 2009. Image courtesy of Scarla Weeks/UQ.*



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<sup>1</sup> [www.barrierreef.org/Portals/0/Oxford\\_report/GBRF\\_OxfordReport\\_Final\\_WEB.pdf](http://www.barrierreef.org/Portals/0/Oxford_report/GBRF_OxfordReport_Final_WEB.pdf)

## V. Protecting and enhancing Australia's culture and heritage

*In line with DEWHA's fifth strategic outcome, a significant component of MTSRF-funded research aims to increase the effectiveness of efforts to protect and conserve the Great Barrier Reef and Wet Tropics World Heritage Areas, as well as supporting the region's Indigenous heritage through building capacity and resilience to change within Indigenous communities, especially in the Torres Strait.*

### Improving rainforest revegetation outcomes

Researchers from Griffith University funded by the MTSRF and Terrain NRM have produced a toolkit – [Monitoring Revegetation Projects For Biodiversity In Rainforest Landscapes<sup>1</sup>](#) – which is already being used extensively by local councils, landholders and rehabilitation specialists, including other [MTSRF researchers<sup>2</sup>](#), [Green Corridors<sup>3</sup>](#) (Barron River Integrated Catchment Management Association), Kuranda EnviroCare, [Conservation Volunteers Australia<sup>4</sup>](#) and [Rainforest Rescue<sup>5</sup>](#). Important elements of the toolkit are also being used in revegetation programs outside the MTSRF region by [EnvITE<sup>6</sup>](#) and Brisbane City Council. The toolkits are user-friendly but ecologically meaningful for monitoring progress of vegetation condition and biodiversity at sites whose vegetation is changing, either because of impacts (including land clearing and cyclones) or recovery processes (including regrowth, restoration and reforestation). [WTMA, Terrain NRM Ltd, local councils, NGOs, landholders]



*MTSRF-funded research has shown that long-term monitoring and maintenance are essential for the success of rainforest revegetation projects. Image courtesy of Suzanne Long / RRRRC.*

1 [www.rrrc.org.au/publications/biodiversity\\_monitoring2.html](http://www.rrrc.org.au/publications/biodiversity_monitoring2.html)

2 [www.rrrc.org.au/mtsr/theme\\_4/project\\_4\\_9\\_3.html](http://www.rrrc.org.au/mtsr/theme_4/project_4_9_3.html)

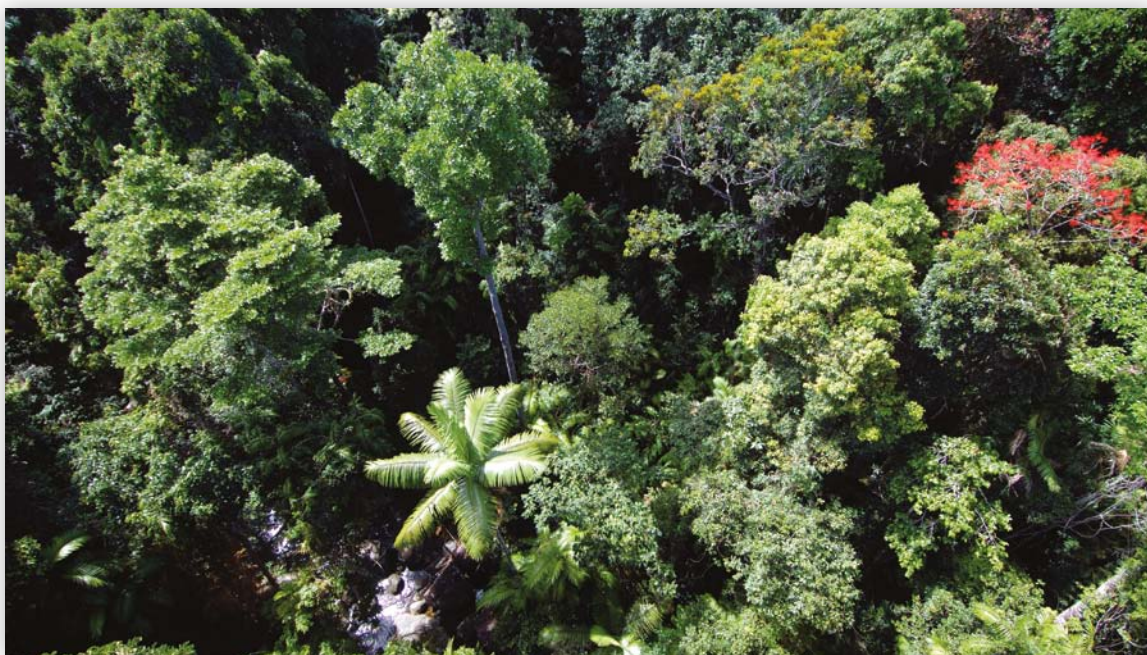
3 [www.barronriver.org.au/green\\_corridor/Index.htm](http://www.barronriver.org.au/green_corridor/Index.htm)

4 [www.conservationvolunteers.com.au/shellecovolunteers/athertonrainforests.htm](http://www.conservationvolunteers.com.au/shellecovolunteers/athertonrainforests.htm)

5 [www.rainforestrescue.org.au/](http://www.rainforestrescue.org.au/)

6 [www.envite.org.au/](http://www.envite.org.au/)





## Growing community support for the Wet Tropics World Heritage Area

The need to develop a comprehensive understanding of the role that protected areas play in the lives of communities is as important as developing a greater understanding of the scientific aspects of protected areas. Social science surveys funded by the MTSRF have shown that, among other things, community support for the Wet Tropics World Heritage Area has grown since 2002. Also of note amongst the results is the increasing support for inclusion of Aboriginal Cultural Heritage in the World Heritage listing. The [full survey results](#)<sup>1</sup> were publicly launched in a technical report in December 2008, and are freely available via the RRRC website. They are already being used by WTMA in partial fulfillment of its annual reporting obligations to both State and federal governments, and in public information brochures. WTMA is presently scoping the feasibility of presenting these results in a formal report to the World Heritage Commission in 2010. [local councils, NGOs, tourism industry, State agencies, WTMA, DEWHA]

## Interactive key to Australian Wet Tropics rainforest plants

MTSRF funding has enabled the entire vascular plant community found in Wet Tropics rainforest habitats to be incorporated into a single taxonomic key, a unique achievement for any rainforest in the world. The beta version of this invaluable tool for managers, scientists and decision makers is already available to users of the Public Reference Collection in the [Australian Tropical Herbarium](#)<sup>2</sup>, with the final two sections to be operational by mid-2009. [Queensland Herbarium, WTMA, Federal and State Governments]

## “Which Way? Bama Way”: Handbook recording Bama culture, history and places

The Handbook seeks to encourage all Wet Tropics Traditional Owners with the capacity to become researchers and go out and record stories, history and cultural heritage as a matter of urgency. In addition, parts of the Handbook can be used as an information tool for non-Bama people, government and non-government organisations, researchers, etc intending to walk, work or play on-country or undertake research, as the book touches on issues such as protocols and consents. The Handbook has been distributed in final draft form to traditional owners, university libraries and NGOs and will be publicly launched in mid 2009. [Traditional Owners, Government Agencies]

<sup>1</sup> [www.rrrc.org.au/publications/downloads/Entire-Document.pdf](http://www.rrrc.org.au/publications/downloads/Entire-Document.pdf)

<sup>2</sup> [www.anbg.gov.au/chah/resources/herbaria/cns.html](http://www.anbg.gov.au/chah/resources/herbaria/cns.html)

## Delivering knowledge generated through CRC Torres Strait



One of the immediate responsibilities of the MTSRF was to ensure that the knowledge gained from research conducted under the foregoing CRC Torres Strait was conserved and made available to future investigations. As part of achieving this objective, the MTSRF funded the publication of a special issue of the international scientific journal *Continental Shelf Research* (Vol 28 No.16) in September 2008. [scientific community, DIISR]

*The MTSRF contributed funding towards the publication of the findings of the CRC Torres Strait in a special issue of the international scientific journal *Continental Shelf Research*. ([ctrl-click on image to see contents<sup>1</sup>](#))*

## MTSRF information contributes to Planet Safe Partnership

North Queensland's peak tourism industry body, Tourism Tropical North Queensland (TTNQ), is using MTSRF-generated information to educate their members (regional tourism businesses) and prospective tourists to the region about environmental sustainability issues. [Their specially designed website<sup>2</sup>](#) relies heavily on links to regularly updated technical and interpreted information available via the RRRC website. The Australian Government's Department of Resources, Energy and Tourism has co-invested with TTNQ in this product [north Queensland tourism industry, DRET].

## Science supporting the development of a new industry for the Torres Strait

Scientific research into natural sponge populations by many organisations (including the MTSRF) has paved the way for approval for a proposed commercial sponge aquaculture farm, which will provide the local Indigenous community with income. MTSRF-funded research will continue to ensure that EPBC assessment processes are informed and that sponge farming is environmentally sustainable. [TOs in the Torres Strait, TSRA, Queensland Government, DEWHA]



*The Hon. Desley Boyle, then Minister for Tourism, Regional Development and Industry (right, holding some Yorke Island sponges) announces that Kailag Enterprises will receive state government funding through the Indigenous Businesses Development Scheme to develop a commercial sponge farm in the Torres Strait (Cairns, late 2008). Also present are (L-R) Darren Cleland from DTRDI in Cairns, Dr Libby Evans-Illidge from AIMS, Philippa Bauer from Kailag Enterprises, and Prof David Yellowlees from JCU.*

1 [www.sciencedirect.com/science?\\_ob=PublicationURL&\\_tockey=%23TOC%235928%232008%23999719983%23697477%23FLA%23&\\_cdi=5928&\\_pubType=J&\\_auth=y&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=9623df9df90f1c5175f05a3dc6752890](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235928%232008%23999719983%23697477%23FLA%23&_cdi=5928&_pubType=J&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=9623df9df90f1c5175f05a3dc6752890)  
2 [www.planetsaferesearch.com.au/](http://www.planetsaferesearch.com.au/)



## Incorporating new knowledge about dugongs into their management in the GBR and Torres Strait

The MTSRF report *Dugong distribution and abundance on the urban coast of Queensland: a basis for management*, which was written with the specific aim of informing management of this species, provides substantial support for the locations that were selected as important dugong habitats in GBRMPA's Representative Area Program. This report has also been used in negotiations about future management arrangements for the East Coast Inshore Finfish Fishery. In addition RRRC facilitated a technical workshop on 12-13 August 2009 in Cairns, during preparation of DEWHA's Wildlife Conservation Plan for Dugongs. The plan will build on existing dugong protection measures and new information from the MTSRF, and will assist in the coordination of local, state, national and international conservation and management activities. [GBRMPA, TSRA, Queensland Government, DEWHA]

## Constructive contribution to controversial swim-with-whales ecotourism debate

The prize for the best student poster or talk at the [2009 annual MTSRF conference](#)<sup>1</sup> was won by Arnold Mangott of JCU for his thoughtful presentation describing his PhD research into the impacts of tourism on dwarf minke whales. Following his presentation, a senior end user from the tourism industry publicly thanked Arnold for opening the industry's eyes and making such a constructive contribution to the controversial debate about expansion of this particular ecotourism venture. [GBRMPA, marine tourism industry]

## Preliminary model for forecasting risk of exposure to irukandji

The marine tourism industry in north Queensland has long called for increased understanding of the seasonal distribution of venomous jellyfishes such as irukandji in the waters of the Great Barrier Reef. In response, the MTSRF has funded researchers from JCU and the tourism industry to spatially assess the risk of irukandji exposure, resulting in the development of preliminary risk maps, which will be made available to tour operators, management agencies and the general public through the [e-Atlas](#)<sup>2</sup>. Guidelines are also being developed for marine operators and public that identifies techniques to minimise risk of exposure to a range of marine stingers and actions to take if contact with stingers is made. [Marine tourism industry, Surf Lifesaving Australia, Queensland Health]



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<sup>1</sup> [www.rrrc.org.au/news/2009\\_conference.html](http://www.rrrc.org.au/news/2009_conference.html)

<sup>2</sup> [www.e-atlas.org.au/](http://www.e-atlas.org.au/)



## Delivering for the north Queensland tourism industry

The MTSRF is funding researchers from JCU to produce ongoing industry monitoring data of direct use to both management agencies and tourism operators, which RRRC then provides in a synthesised form in briefing notes to Australian and Queensland Government tourism agencies. These regular outputs are publicly available online via the RRRC website and include [Tourism Barometers](#)<sup>1</sup>, [media releases](#)<sup>2</sup> and reports. The latest results of this ongoing research project are regularly presented to the industry by the researchers and RRRC staff and contractors through joint briefings with TTNQ (for example at TTNQ's Research and Insights Forum on 8<sup>th</sup> May 2009 in Cairns). Feedback received from local business people in the industry indicates that information is being successfully delivered to these important end users, that they consider the research results credible, and that they are considering how to use the information to increase the sustainability of their industry. [WTMA, TTNQ and industry, state government, DRET]



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1 [www.rrrc.org.au/publications/tourism\\_barometers.html](http://www.rrrc.org.au/publications/tourism_barometers.html)

2 [www.rrrc.org.au/mediadirectory/downloads/Media-Release-Tourists-Have-Say-080109.pdf](http://www.rrrc.org.au/mediadirectory/downloads/Media-Release-Tourists-Have-Say-080109.pdf)



## VI. Improving organisational effectiveness

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*Lessons learned from the considerable success of this MTSRF/RRRC experiment into improving returns on investment in applied science, including knowledge transfer experience, should be of great value to DEWHA as it seeks to improve its organisational effectiveness and efficiency.*

### Enhancing the links between science and policy

There is increasing worldwide recognition of the unquantified cost of failure to transfer new research-generated knowledge to policy- and decision-makers. Enhancing the sometimes poor links between science and policy must be a high priority given the Australian Government's commitment to evidence-based policy. In the context of the recent reviews of the Cooperative Research Centre program and the national innovation system, it is both timely and appropriate to consider how publicly-funded, public-good research might more reliably inform Australian public policy.

A [recent international study](#)<sup>1</sup> of this issue in Europe and North America is strongly supportive of a new mode of research management and delivery, very similar to that currently embodied by the MTSRF and RRRC. The analysis draws conclusions from a series of detailed interviews with both researchers and policy-makers across the UK and Europe, and recommends a number of ways to increase the rate at which publicly-funded, public-good research successfully informs policy. RRRC is engaged with the researchers in discussions about the possibility of extending their study to the Australian sphere.

### Minimising slippage of end-user driven applied research projects

The RRRC has developed a novel research management and delivery framework designed to achieve maximum return on investment in applied research. Dedicated program managers with significant relevant scientific expertise act to maximise synergies between projects, facilitate milestone development and review, and broker end-user needs. The result is timely delivery of milestones that meet end user needs, against a background of scientific credibility and fiscal transparency.

Ongoing consultation and fulfillment of project objectives with respect to end users' needs assists in building the confidence of end users, research providers and funding agencies in the program. This structure has been remarkably successful in significantly improving delivery performance of milestones, with the vast majority of milestone reports being delivered on time and to a high standard. The CRC Reef, Fisheries Research and Development Corporation and other like entities consider 20% slippage of research delivery to be fairly normal, yet the RRRC has achieved 0% slippage in Year 1, 3.7% slippage in Year 2 and 3.3% slippage in Year 3 of the MTSRF. These efficiency gains speak for themselves.

### RRRC's approach to strategic enhanced delivery (knowledge brokering)

The effectiveness of governance is frequently limited not only by lack of information, but by lack of awareness and uptake of existing information. The reasons for this knowledge transfer failure may appear complex, but usually reflect the differing motivations and priorities of researchers and decision-makers – neither is usually provided with the time, resources or incentive necessary to achieve successful knowledge transfer. The MTSRF is producing scientific information with the specific objective of enabling north Queensland's management, policy and practice to become more environmentally sustainable.

Effective transfer of new knowledge to a very wide range of policy- and decision-makers is essential if the MTSRF is to achieve its aim, and to this end RRRC has established a dedicated and appropriately resourced Enhanced Delivery program. The RRRC is well placed to assist as a broker for the MTSRF. Its role in MTSRF project management requires the RRRC to be embedded in many activities important for successful delivery, such as annual conferences, joint researcher / end user workshops and the collaborative definition of research questions. This means the RRRC can

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<sup>1</sup> Summarised in Issue 138 of European Commission Science for Environment Policy, 29 January 2009, [ec.europa.eu/environment/integration/research/newsalert/chronological\\_en.html#Jan09](http://ec.europa.eu/environment/integration/research/newsalert/chronological_en.html#Jan09)

maintain an overview of the MTSRF activities while remaining fully engaged with both researcher providers and end users. Strategic synthesis and transfer of MTSRF research results to targeted end users is followed wherever possible by monitoring and evaluation of transfer success, such that the knowledge transfer process can be made more efficient and effective over time.

### **Lessons learned from review of rainforest revegetation projects**

This MTSRF-funded study has shown that failure of NHT1 revegetation projects was commonly the result of a lack of attention to monitoring and follow-up maintenance (such as weed control) in the early years following planting, which stems from the one-off year-to-year manner in which the NHT scheme was largely implemented, coupled with funding uncertainties from one year to the next. These insights into the implications of investment style and emphasis have been successfully delivered to DEWHA by RRRC, and can be used to improve the success of publicly-funded environmental management programs in future.



*Senator for Queensland and President of the Senate, The Hon. John Hogg (centre), inspects a site that is being revegetated using tools developed through the MTSRF, escorted by RRRC, Rainforest Rescue representative David Cook (left) and QPWS ranger (right). Cow Bay, Daintree region, 7 May 2009.*





## Appendix 1: MTSRF publications

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From July 2006 through to 1 September 2009, MTSRF-funded researchers have authored or contributed to over one hundred scientific journal articles, books and book chapters, including publications in *Science* and *Nature*. Hundreds of other technical reports and documents describing MTSRF-funded research are available for public viewing and download from the MTSRF website.

### Peer-reviewed Scholarly Articles

Up-to-date list available online at [www.rrrc.org.au/publications/journal\\_articles.html](http://www.rrrc.org.au/publications/journal_articles.html)

- Anthony, K. R., Hoogenboom, M. O., Maynard, J. A., Grottoli, A. and Middlebrook, R. (2009) Energetics approach to predicting mortality risk from environmental stress: A case study of coral bleaching. *Functional Ecology* 23(3): 539-550 [doi:10.1111/j.1365-2435.2008.01531.x]
- Anthony, K. R. N., Kline, D. I., Diaz-Pulido, G., Dove, S. and Hoegh-Guldberg, O. (2008) Ocean acidification causes bleaching and productivity loss in coral reef builders. *Proceedings of the National Academy of Sciences of the United States of America* 105(45): 17442-17446 [doi:10.1073/pnas.0804478105]
- Arthington, A. H. (2009) Australian lungfish, *Neoceratodus forsteri*, threatened by a new dam. *Environmental Biology of Fishes* 84(2): 211-221 [doi:10.1007/s10641-008-9414-y]
- Asner, G. P., Martin, R. E., Ford, A. J., Metcalfe, D. J. and Liddell, M. J. (2009) Leaf chemical and spectral diversity in Australian tropical forests. *Ecological Applications* 19(1): 236-253 [doi:10.1890/08-0023.1]
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- Balcombe, S. R. and Arthington, A. H. (2009) Temporal changes in fish abundance in response to hydrological variability in a dryland floodplain river. *Marine Freshwater Research* 60(2): 146-159 [doi:10.1071/MF08118]
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- Bruno, J. F., Sweatman, H., Precht, W. F., Selig, E. R. and Schutte, V. G. W. (2009) Assessing evidence of phase shifts from coral to macroalgal dominance on coral reefs. *Ecology* 90(6): 1478-1484 [doi:10.1890/08-1781.1]
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- Catterall, C. P., McKenna, S., Kanowski, J. and Piper, S. D. (2008) Do cyclones and forest fragmentation have synergistic effects? A before-after study of rainforest revegetation structure at multiple sites. *Austral Ecology* 33(4): 471-484 [doi:10.1111/j.1442-9993.2008.01902.x]



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23	Theme 5 Enhancing Delivery Dr L. DeVantier, Consultant	<b>Great Barrier Reef Research: Baseline Synthesis and Year 1 Summary</b> ISBN 9781921359224 Published February 2009 <a href="http://www.rrrc.org.au/publications/gbr_synthesis.html">www.rrrc.org.au/publications/gbr_synthesis.html</a>
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17	Projects 4.8.6 / 4.9.2 Dr K. McNamara, JCU Prof B. Prideaux, JCU	<b>Tourist Exit Survey First Annual Report: January – December 2007</b> <i>Annual and Quarterly Patterns of Reef and Rainforest Tourism in North Queensland from Exit Surveys Conducted at Cairns Domestic Airport</i> ISBN 9781921359163 Published September 2008 <a href="http://www.rrrc.org.au/publications/tourist_exitsurvey.html">www.rrrc.org.au/publications/tourist_exitsurvey.html</a>
16	Project 4.9.2 Dr K. McNamara, JCU Prof B. Prideaux, JCU	<b>Rainforest Tourism First Annual Report: January – December 2007</b> <i>Annual and Quarterly Patterns of Rainforest Tourism in the Wet Tropics World Heritage Area, North Queensland</i> ISBN 9781921359156 Published September 2008 <a href="http://www.rrrc.org.au/publications/rainforest_tourism.html">www.rrrc.org.au/publications/rainforest_tourism.html</a>
15	Project 2.6.1 Dr L. Sparrow, JCU Dr K. Heimann, JCU	<b>The Influence of Nutrients and Temperature on the Global Distribution of Algal Blooms</b> ISBN 9781921359149 Published September 2008 <a href="http://www.rrrc.org.au/publications/algal_blooms.html">www.rrrc.org.au/publications/algal_blooms.html</a>
14	CRC-MTSRF Transition Report Mr G. Dawe, JCU Dr M. Goosem, JCU	<b>Noise Disturbance Along Highways: Kuranda Range Road Upgrade Project</b> ISBN 9781921359132 Published October 2008 <a href="http://www.rrrc.org.au/publications/noise_disturbance.html">www.rrrc.org.au/publications/noise_disturbance.html</a>
13	Project 4.9.3 Dr C. Pohlman, JCU Dr M. Goosem, JCU	<b>The effects of Severe Tropical Cyclone Larry on rainforest vegetation and understorey microclimate adjacent to powerlines, highways and streams in the Wet Tropics World Heritage Area</b> ISBN 9781921359125 Published August 2008 <a href="http://www.rrrc.org.au/publications/cyclonelarry_vegetationandmicroclimate.html">www.rrrc.org.au/publications/cyclonelarry_vegetationandmicroclimate.html</a>
12	Project 3.7.1 Dr K. Nobes, AIMS Dr S. Uthicke, AIMS	<b>Benthic Foraminifera of the Great Barrier Reef</b> <i>A guide to species potentially useful as Water Quality Indicators</i> ISBN 9781921359118 Published August 2008 <a href="http://www.rrrc.org.au/publications/benthic_foraminifera.html">www.rrrc.org.au/publications/benthic_foraminifera.html</a>



Report No.	MTSRF Project and Key Author/s	Report Title and Details
11	Project 4.9.4 Dr N. Emtage, UQ et al.	<b>The management of forests, plantations and remnant vegetation patches for biodiversity conservation</b> <i>Principles and recommended tree species for revegetation plantings on the Atherton Tablelands, North Queensland</i> ISBN 9781921359101 Published August 2008 <a href="http://www.rrrc.org.au/publications/vegetation_management.html">www.rrrc.org.au/publications/vegetation_management.html</a>
10	Project 4.9.4 Dr N. Emtage, UQ Dr J. Reghenzani, Terrain NRM	<b>Wet Tropics Sustainable Agriculture Survey Interim Report</b> <i>A survey of rural landholders in the Wet Tropics Natural Resource Management region</i> ISBN 9781921359095 Published May 2008 <a href="http://www.rrrc.org.au/publications/agriculture_survey.html">www.rrrc.org.au/publications/agriculture_survey.html</a>
9	Project 4.9.3 Dr M. Goosem, JCU et al.	<b>Highway Overpass Evaluation of Effectiveness: Kuranda Range Road Upgrade Project</b> ISBN 9781921359088 Published July 2008 <a href="http://www.rrrc.org.au/publications/highway_overpasses.html">www.rrrc.org.au/publications/highway_overpasses.html</a>
8	Project 4.8.6 Dr A. Coghlan, JCU Prof B. Prideaux, JCU	<b>Reef Tourism First Yearly Report: November 2006 – October 2007</b> <b>Quarterly Patterns of Reef Tourism on the Great Barrier Reef – Northern, Central and Whitsunday Areas</b> ISBN 9781921359071 Published July 2008 <a href="http://www.rrrc.org.au/publications/reef_tourism.html">www.rrrc.org.au/publications/reef_tourism.html</a>
7	Project 4.8.5 Dr S. Sutton, JCU	<b>Recreational fishers' perceptions about the costs and benefits of the 2004 Great Barrier Reef Marine Park Zoning Plan</b> ISBN 9781921359064 Published May 2008 <a href="http://www.rrrc.org.au/publications/recreational_fishers.html">www.rrrc.org.au/publications/recreational_fishers.html</a>
6	Project 4.8.2 Dr P. Speare, AIMS Dr M. Stowar, AIMS	<b>A comparative study between fished and protected inter-reefal shoal habitats and their fish communities on the Great Barrier Reef</b> <i>Report on ongoing monitoring off Townsville and initial surveys near Cardwell and Cairns, North Queensland</i> ISBN 9781921359057 Published May 2008 <a href="http://www.rrrc.org.au/publications/shoal_habitats.html">www.rrrc.org.au/publications/shoal_habitats.html</a>





Report No.	MTSRF Project and Key Author/s	Report Title and Details
5	Project 1.4.1 Prof H. Marsh, JCU et al.	<b>Condition, status and trends and projected futures of the dugong in the Northern Great Barrier Reef and Torres Strait</b> <i>Including identification and evaluation of the key threats and evaluation of available management options to improve its status</i> ISBN 9781921359057 Published April 2008 <a href="http://www.rrrc.org.au/publications/dugong_statusandtrends.html">www.rrrc.org.au/publications/dugong_statusandtrends.html</a>
4	Project 2.6.1 S. Garrard, JCU et al.	<b>Assessment of the Threat of Toxic Microalgal Species to the Great Barrier Reef World Heritage Area</b> ISBN 9781921359033 Published March 2008 <a href="http://www.rrrc.org.au/publications/toxic_microalgae.html">www.rrrc.org.au/publications/toxic_microalgae.html</a>
3	Catchment to Reef Joint Research Program – Rainforest CRC and CRC Reef Research Centre Dr K. Fabricius, AIMS et al.	<b>Candidate Bioindicator Measures to Monitor Exposure to Changing Water Quality on the Great Barrier Reef</b> ISBN 9781921359026 Published August 2007 <a href="http://www.rrrc.org.au/publications/waterquality_bioindicators.html">www.rrrc.org.au/publications/waterquality_bioindicators.html</a>
2	CRC Reef Research Centre Dr H. Sweatman, AIMS et al.	<b>Status of Near-Shore Reefs of the Great Barrier Reef 2004</b> ISBN 9781921359019 Published June 2007 <a href="http://www.rrrc.org.au/publications/nearshore_reefs.html">www.rrrc.org.au/publications/nearshore_reefs.html</a>
1	Project 4.9.5 Dr J. Kanowski, GU A/Prof C. Catterall, GU	<b>Monitoring Revegetation Projects for Biodiversity in Rainforest Landscapes: Toolkit Version 1, Revision 1</b> ISBN 9781921359002 Published May 2007 <a href="http://www.rrrc.org.au/publications/biodiversity_monitoring.html">www.rrrc.org.au/publications/biodiversity_monitoring.html</a>

## Other publications available for download from the MTSRF website

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This section outlines the project milestone reports, research and technical reports and other outputs describing MTSRF-funded research available for download from the MTSRF website.

MTSRF Project	Project Leader OR Lead Author, Institute	Title of Website Link
<b>Project 1.1.1</b>	Dr H. Sweatman, AIMS	Project 1.1.1 AIMS Sweatman, H. (2009) April Milestone Report
<b>Project 1.1.1</b>	Dr R. Pitcher, CSIRO	Project 1.1.1 CSIRO/AIMS Pitcher, R. et al. (2007) Indicators of protection levels for seabed habitats, species and assemblages on the continental shelf of the Great Barrier Reef World Heritage Area
<b>Project 1.1.2</b>	Ms M-L Schläppy, RCA	Project 1.1.2 RCA Schläppy, M-L (2009) June Milestone Report
<b>Project 1.1.2</b>	Dr H. Sweatman, AIMS	Project 1.1.2 AIMS Sweatman, H. (2009) March Milestone Report



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Project 1.1.2	Ms M-L Schläppy, RCA	Project 1.1.2 RCA Schläppy, M-L (2009) March Milestone Report
Project 1.1.2	Dr H. Sweatman, AIMS	Project 1.1.2 AIMS Sweatman, H (2007) Coral reef health indicators and thresholds of concern
Project 1.1.2	Dr P. Doherty, AIMS	Project 1.1.2 AIMS Doherty, P. (2007) Reef Check Australia Dive Operators' Workshop - Feedback
Project 1.1.2	Dr P. Doherty, AIMS	Project 1.1.2 RCA Newsletter February 2007
Project 1.1.2	Dr P. Doherty, AIMS	Project 1.1.2 RCA Newsletter May 2007
Project 1.1.2	Dr H. Sweatman, AIMS	Project 1.1.2 AIMS Sweatman, H. (2007) March Milestone Report
Project 1.1.2	Dr H. Sweatman, AIMS	Project 1.1.2 AIMS Sweatman, H (2008) November Milestone Report
Project 1.1.2	Ms J. Hill, RCA	Project 1.1.2 RCA Hill, J. (2008) December Milestone Report
Project 1.1.3	Dr L. McKenzie, DEEDI	Project 1.1.3 DEEDI McKenzie, L. (2009) June Milestone Report
Project 1.1.3	Dr L. McKenzie, DEEDI	Project 1.1.3 DEEDI McKenzie, L. (2009) May Milestone Report
Project 1.1.3	Ms A. Grech, JCU	Project 1.1.3 JCU Grech, A. et al. (2008) Spatial risk assessment for coastal seagrass habitats in the Great Barrier Reef World Heritage Area: Case Study
Project 1.1.3	Dr R. Coles, DEEDI	Project 1.1.3 DEEDI Coles, R. et al. (2007) Status and trends of seagrass habitats in the Great Barrier Reef World Heritage Area.
Project 1.1.3	Dr M. Rasheed, DEEDI	Project 1.1.3 DEEDI Rasheed, M. et al. (2008) Coastal seagrass habitats at risk from human activity in the Great Barrier Reef World Heritage Area: Review of areas to be targeted for monitoring
Project 1.1.3	Dr G. De'ath, AIMS	Project 1.1.3 AIMS De'ath, G. (2008) Spatial distributions and temporal change in distributions of deep water seagrasses in the Great Barrier Reef region
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 26, July 2006
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 27, November 2006
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 28, March 2007
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 29, June 2007
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 30, September 2007
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 31, December 2007
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 32, March 2008
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass-Watch Newsletter, Issue 33, June 2008
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass Watch Newsletter, Issue 35, December 2008



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Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass Watch Newsletter, Issue 36, March 2009
Project 1.1.3	Dr L. McKenzie, DEEDI	Seagrass Watch Newsletter, Issue 37, June 2009
Project 1.1.3	Dr L. McKenzie, DEEDI	Project 1.1.3 JCU QDPIF Waycott, M. McKenzie, L. (2008) December Milestone Report
Project 1.1.4	Dr Jian-xin Zhao, UQ	Project 1.1.4 UQ Zhao, J.-x. (2009) June Milestone Report
Project 1.1.4	Dr Jian-xin Zhao, UQ	Project 1.1.4 UQ Zhao, J-X (2009) January Milestone Report
Project 1.1.4	J. Quaintance, UQ	Project 1.1.4 UQ Quaintance, J. (2007) Coral community structure in life and death assemblages from the Swain Reefs, Great Barrier Reef, Australia
Project 1.1.4	Dr P. Doherty, AIMS	Project 1.1.4 AIMS Doherty, P. (2007) Summary of Project Research Activities 2006/2007
Project 1.1.4	Dr Jian-xin Zhao, UQ	Project 1.1.4 UQ Zhao, J. (2008) January Milestone Report
Project 1.1.4	Dr Jian-xin Zhao, UQ	Project 1.1.4 UQ Zhao, J. (2008) October Milestone Report
Project 1.1.5	Dr K. Fabricius, AIMS	Projects 1.1.5 and 2.5i.1 AIMS Fabricius, K. (2009) e-Atlas: Risk, Resilience and Response – June Milestone Report
Project 1.1.5	Dr K. Fabricius, AIMS	Project 1.1.5 AIMS Fabricius, K. (2008) February Milestone Report
Project 1.1.5	Dr G. De'ath, AIMS	Project 1.1.5 AIMS De'ath, G. (2007) The spatial, temporal and structural composition of water quality of the Great Barrier Reef, and indicators of water quality and mapping risk.
Project 1.2.1	Dr P. Pert, CSIRO	Project 1.2.1 CSIRO Pert, P. (2008) December Milestone Report
Project 1.2.1	Dr J. Butler, CSIRO	Project 1.2.1 CSIRO Butler, J. (2007) December Milestone Report
Project 1.3.1	Dr M. Haywood, CSIRO	Project 1.3.1 CSIRO Haywood, M. et al. (2007) Improved knowledge of Torres Strait seabed biota and reef habitats
Project 1.3.1	Dr M. Haywood, CSIRO	Project 1.3.1 CSIRO Haywood, M. (2007) June Milestone Report
Project 1.3.1	Dr D. Green, UNSW	Project 1.3.1 UNSW Green, D. (2007) December Milestone Report
Project 1.3.1	Dr D. Green, UNSW	Project 1.3.1 UNSW Green, D. (2008) May Milestone Report
Project 1.3.2	Dr A. Duckworth, AIMS	Project 1.3.2 Duckworth, A. (2008) Ecological Role and Potential Value of Sponges to Torres Strait – Annual Report 2008
Project 1.3.2	Dr A. Duckworth, AIMS	Project 1.3.2 Duckworth, A. (2006) Distribution and abundance of the bath sponge Coscinoderma in Central and Eastern Torres Strait
Project 1.3.2	Dr A. Duckworth, AIMS	Project 1.3.2 AIMS Duckworth, A. (2006) Report from November 2006 Survey
Project 1.3.2	Dr A. Duckworth, AIMS	Project 1.3.2 AIMS Duckworth, A. (2007) February Milestone Report
Project 1.3.2	Dr A. Duckworth, AIMS	Project 1.3.2 AIMS Duckworth, A. (2007) Ecological Role and Potential Value of Sponges to Torres Strait – Annual Report 2007
Project 1.3.3	Mr A. Tawake, JCU	Project 1.3.3 JCU Tawake, A. (2008) Livelihood benefits of adaptive co-management of hand collectable fisheries in the Torres Strait
Project 1.3.3	Prof. H. Marsh, JCU	Project 1.3.3 JCU Marsh, H. (2008) Spatial closures as possible management tools for community-based management of dugongs and turtles in Torres Strait





MTSRF Project	Project Leader OR Lead Author, Institute	Title of Website Link
Project 1.3.3	Dr S. Pascoe, CSIRO	Project 1.3.3 CSIRO Pascoe, S. (2007) Preliminary review of key resource economics in the Torres Strait
Project 1.3.4	Mr D. Miley, TSRA	Project 1.3.4 TSRA Miley, D. (2008) May Final Milestone Report
Project 1.3.4	Mr V. McGrath, TSRA	Project 1.3.4 TSRA McGrath, V. (2007) Project Activity Plan
Project 1.3.5	Mr V. McGrath, TSRA	Project 1.3.5 TSRA McGrath, V. (2007) June Project Milestone Report.
Project 1.4.1(e)	Dr G. Parra, UQ	Project 1.4.1(e) UQ Parra, G. et al. (2009) Feeding habits of Australian Snubfin ( <i>Orcaella heinsohni</i> ) and Indo-Pacific humpback dolphins ( <i>Sousa chinensis</i> )
Project 1.4.1	Dr M. Hamann, JCU	Project 1.4.1 JCU Hamann, M. (2009) January Milestone Report
Project 1.4.1	Dr M. Hamann, JCU	Project 1.4.1 JCU Hamann, M. (2008) September Milestone Report
Project 1.4.1	Dr M. Hamann, JCU	Project 1.4.1 JCU Hamann, M. (2007) Project Milestone Report (Objective B) June
Project 1.4.1	Prof. H. Marsh, JCU	Project 1.4.1 JCU Marsh, H. (2007) Northern Great Barrier Reef and Torres Strait Final Report
Project 1.4.2	Prof. H. Marsh, JCU	Project 1.4.2 JCU Marsh, H. (2008) June Milestone Report
Project 1.4.2	Ms A. Grech, JCU	Project 1.4.2 JCU Grech, A. et al. (2008) Torres Strait Community GIS: Building the capacity of Torres Strait Islander communities in Natural Resource Management through integration of Traditional Ecological Knowledge and Western Scientific Knowledge
Project 1.4.2	Prof. H. Marsh, JCU	Project 1.4.2 JCU Marsh, H. (2008) September Milestone Report
Project 1.4.2	Prof. H. Marsh, JCU	Project 1.4.2 JCU Berg, A. (2007) Effects of Acoustic Alarms on Coastal Dolphins – Powerpoint Slides
Project 1.4.2	A. Berg Soto, JCU	Project 1.4.1 JCU Marsh, H. (2007) June Final Report
Project 1.4.3	Dr D. Metcalfe, CSIRO	Project 1.4.3 CSIRO (2009) The spatial distribution and characteristics of the Queensland Forest Service rainforest map units in the Wet Tropics of North Queensland
Project 1.4.3	Dr. A. Krockenberger, JCU	Project 1.4.3 JCU Krockenberger, A. (2008) November Interview Transcript 'Save our ringtails'
Project 1.4.3	Dr D. Metcalfe, CSIRO	Project 1.4.3 CSIRO Metcalfe, D. (2007) August Milestone Report
Project 2.5i.1	Dr K. Fabricius, AIMS	Projects 1.1.5 and 2.5i.1 AIMS Fabricius, K. (2009) e-Atlas: Risk, Resilience and Response – June Milestone Report
Project 2.5i.2	Prof O. Hoegh-Guldberg, UQ	Project 2.5i.2 UQ Hoegh-Guldberg, O. (2009) January Milestone Report
Project 2.5i.2	Dr S. Weeks, UQ	Project 2.5i.2 UQ Weeks, S. (2009) January Milestone Report
Project 2.5i.2	Prof. O. Hoegh-Guldberg, UQ	"Other Resources" article added to Project 2.5i.2 webpage with external link to GBRMPA's BleachWatch program with current condition reports available for download: <a href="http://www.rrrc.org.au/mtsr/theme_2/project_2_5i_2.html">www.rrrc.org.au/mtsr/theme_2/project_2_5i_2.html</a>
Project 2.5i.2	Prof. O. Hoegh-Guldberg, UQ	Project 2.5i.2 UQ Hoegh-Guldberg, O. (2007) November Milestone Report
Project 2.5i.3	Prof. T. Hughes, JCU	Project 2.5i.3 JCU Hughes, T. (2009) March Milestone Report
Project 2.5i.3	Prof. T. Hughes, JCU	Project 2.5i.3 JCU Hughes, T. (2008) February Milestone Report



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Project 2.5i.3	Prof. T. Hughes, JCU	Project 2.5i.3 JCU Hughes, T. (2007) Project Milestone Report June
Project 2.5i.3	Prof. T. Hughes, JCU	Project 2.5i.3 JCU Hughes, T. (2007) Herbivory by fishes on the Great Barrier Reef: A review of knowledge and understanding
Project 2.5i.4	Dr I. Gordon, CSIRO	Project 2.5i.4 CSIRO Gordon, I. et al. (2009) January Milestone Report
Project 2.5i.4	Prof. B. Miles, CQU	Project 2.5i.4 CQU Miles, R. et al. (2009) Assessing the Socio-Economic Implications of Climate Change (Coral Bleaching) in the Great Barrier Reef Catchment
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2009) Modelling the improved resilience of inshore coral reefs to climate change due to terrestrial water quality improvements: A case study of the Burdekin River catchment
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2009) January Milestone Report
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2008) January Milestone Report
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2007) Linking land-use change scenarios with predicted water quality improvements within the GBR lagoon
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2008) Regional Scale Coral Bleaching Predictions for the Great Barrier Reef
Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2007) Linking land-use change scenarios with predicted water quality improvements within the GBR lagoon
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Project 2.5i.4	Dr S. Wooldridge, AIMS	Project 2.5i.4 AIMS Wooldridge, S. (2007) November Milestone Report
Project 2.5ii.1	Dr M. Thatcher, CSIRO	Project 2.5ii.1 CSIRO Thatcher, M. et al (2007) Regional climate downscaling for the Marine and Tropical Sciences Research Facility (MTSRF) between 1971 and 2000
Project 2.5ii.1	Dr S. Ramasamy, CSIRO	Project 2.5ii.1 CSIRO Ramasamy, S. (2007) Climate Change Projections for the Tropical Rainforest Region of North Queensland
Project 2.5ii.2	Dr M. Liddell, JCU	Project 2.5ii.2 JCU Liddell, M. (2009) March Milestone Report
Project 2.5ii.2	Dr M. Liddell, JCU	Project 2.5ii.2 JCU Liddell, M. (2007) June Milestone Report
Project 2.5ii.2	Dr M. Liddell, JCU	Project 2.5ii.2 JCU Liddell, M. (2008) November Milestone Report
Project 2.5ii.3	Dr D. Hilbert, CSIRO	Project 2.5ii.3 CSIRO Hilbert, D. (2007) June Milestone Report
Project 2.5ii.4	A. Prof. S. Williams, JCU	Project 2.5ii.4 JCU Williams, S. (2009) March Milestone Report
Project 2.5ii.4	A. Prof. S. Williams, JCU	Project 2.5ii.4 JCU Williams, S. (2007) March Milestone Report



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Project 2.5ii.4	A. Prof. S. Williams, JCU	Project 2.5ii.4 JCU Williams, S. (2007) June Milestone Report
Project 2.5ii.4	A. Prof. S. Williams, JCU	Project 2.5ii.4 JCU Williams, S. (2007) November Milestone Report
Project 2.6.1	Dr K. Heimann, JCU	Project 2.6.1 JCU Heimann, K. et al. (2009) March Interim Report – Part 1 – Laboratory culture of marine microalgae of the Great Barrier Reef toxic dinoflagellate cultures established by the North Queensland Algal Identification/Culturing Facility (NQAIF)
Project 2.6.1	Dr D. Blair, JCU	Project 2.6.1 JCU Blair, D. et al. (2009) March Interim Report – Part 2 – Review of genetic probe development for invasive marine species, with a focus on choice of target gene and on DNA amplification technology
Project 2.6.1	Dr D. Blair, JCU	Project 2.6.1 JCU Blair, D. (2007) October Milestone Report
Project 2.6.2	Dr E. Poon, CSIRO	Project 2.6.2 CSIRO Poon, E. et al. (2007) Assessment of Research Needs for the Management of Invasive Species in the Terrestrial and Aquatic Ecosystems of the Wet Tropics
Project 3.7.1	Dr A. Negri, AIMS	Project 3.7.1 AIMS Negri, A. (2009) March Milestone Report [Objective (a)]
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2009) March Milestone Report
Project 3.7.1	Dr M. Sheaves, AIMS	Project 3.7.1 AIMS Sheaves, M. (2008) October Milestone Report
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2008) November Milestone Report
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) January Milestone Report
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) June Milestone Report
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) March Milestone Report
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) November Milestone Report
Project 3.7.1	Dr L. McKenzie, DEEDI	Project 3.7.1 DPI McKenzie, L. (2007) Relationships between seagrass communities and sediment properties along the Queensland coast
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Cooper, T. (2007) Coral-based Indicators of Changes in Water Quality on Nearshore Coral Reefs of the Great Barrier Reef
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) The Use of Biomarkers in Barramundi ( <i>Lates calcarifer</i> ) to Monitor Contaminants in Estuaries of Tropical North Queensland
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 JCU Sheaves, M. (2007) Assessment of Techniques for Determining the Health of Tropical Estuarine Ecosystems
Project 3.7.1	Dr K. Fabricius, AIMS	Project 3.7.1 AIMS Fabricius, K. (2007) Conceptual Model of the effects of runoff on the ecology of corals and coral reefs of the Great Barrier Reef
Project 3.7.2	Dr S. Lewis / Mr J. Brodie, JCU	Project 3.7.2 JCU Lewis, S. et al. (2009) April Milestone Report
Project 3.7.2	Mr J. Brodie, JCU	Project 3.7.2 JCU Brodie, J. (2009) Draft Pathway to Impact Report
Project 3.7.2	Dr S. Lewis, JCU	Project 3.7.2 JCU Lewis, S. (2008) November Milestone Report
Project 3.7.2	Mr J. Brodie, JCU	Project 3.7.2 JCU Brodie, J. (2007) June Milestone Report





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<b>Project 3.7.2</b>	Mr J. Brodie, JCU	Project 3.7.2 Brodie, J. (2007) June Milestone Report
<b>Project 3.7.2</b>	Dr E. Wolanski, AIMS	Project 3.7.2 AIMS Wolanski, E. (2007) Wet season fine sediment dynamics on the inner shelf of the Great Barrier Reef
<b>Project 3.7.3</b>	Prof. R. Pearson, JCU Prof. A. Arthington, GU	Project 3.7.3 JCU GU Arthington Pearson (2009) March Milestone Report
<b>Project 3.7.3</b>	Prof. R. Pearson, JCU Prof. A. Arthington, GU	Project 3.7.3 JCU GU Arthington Pearson (2008) December Milestone Report
<b>Project 3.7.3</b>	Prof. R. Pearson, JCU Prof. A. Arthington, GU	Projects 3.7.3/3.7.4 CSIRO Wallace, J. (2007) Hydro-ecological modeling in coastal catchments: Connectivity and hydro-ecological function
<b>Project 3.7.3</b>	Prof. R. Pearson, JCU Prof. A. Arthington, GU	Project 3.7.3 JCU Pearson, GU R. Arthington, A. (2008) June Milestone Report
<b>Project 3.7.3</b>	Prof. R. Pearson, JCU Prof. A. Arthington, GU	Project 3.7.3 JCU Pearson, GU R. Arthington, A. (2008) March Milestone Report
<b>Project 3.7.4</b>	Prof. J. Wallace, CSIRO	Projects 3.7.3/3.7.4 CSIRO Wallace, J. (2007) Hydro-ecological modeling in coastal catchments: Connectivity and hydro-ecological function
<b>Project 3.7.4</b>	Prof. J. Wallace, CSIRO	Project 3.7.3 CSIRO Wallace, J. (2008) June Milestone Report
<b>Project 3.7.4</b>	Prof. J. Wallace, CSIRO	Project 3.7.4 CSIRO Wallace, J. (2008) December Milestone Report
<b>Project 3.7.4</b>	Prof. J. Wallace, CSIRO	Project 3.7.4 CSIRO Wallace, J. (2008) December Milestone Report
<b>Project 3.7.5</b>	Dr M. van Grieken, CSIRO	Project 3.7.5 CSIRO van Grieken, M. (2008) June Milestone Report
<b>Project 3.7.5</b>	Dr P. Roebeling, CSIRO	Project 3.7.5 CSIRO Roebeling, P. et al. (2007) Financial-economic analysis of current best management practices for sugarcane, horticulture, grazing and forestry industries in the Tully-Murray catchment.
<b>Project 3.7.7</b>	Dr R. Bartley, CSIRO	Project 3.7.7 CSIRO Kuhnert, P. et al (2007) Conceptual and statistical framework for a water quality component of an integrated report card for the Great Barrier Reef catchments.
<b>Project 3.7.7</b>	Dr A. Steven, CSIRO	Project 3.7.7 CSIRO Browne, M. et al (2007) Review of existing approaches used to develop integrated report card frameworks (IRCF) and their relevance to catchments draining to the Great Barrier Reef
<b>Project 4.8.1</b>	Prof. T. Hughes, JCU	Project 4.8.1 JCU Hughes, T. (2007) Project Milestone Report June 2007.
<b>Project 4.8.2</b>	Dr M. Stowar, AIMS	Project 4.8.2 AIMS Stowar, M. (2008) Influence of zoning on midshelf shoals of the southern Great Barrier Reef
<b>Project 4.8.2</b>	Dr P. Speare, AIMS	Project 4.8.2 AIMS Speare, P. (2008) Temporal monitoring of northern shoals off Cardwell and Townsville
<b>Project 4.8.2</b>	Dr C. Johansson, AIMS	Project 4.8.2 AIMS Johansson, C. et al. (2008) The use of stereo BRUVS for measuring fish size
<b>Project 4.8.2</b>	Dr P. Doherty, AIMS	Project 4.8.2 AIMS Doherty, P. (2009) March Milestone Report



MTSRF Project	Project Leader OR Lead Author, Institute	Title of Website Link
Project 4.8.2	Dr P. Doherty, AIMS	Project 4.8.2 AIMS Speare, P. (2007) Preliminary findings from the first baseline survey of the Magnetic Shoals
Project 4.8.2	Dr Russ, G. JCU	Project 4.8.2 JCU Russ, G. et al. (2007) June Milestone Report with Overview of Results from 2006/2007 Data Collection
Project 4.8.2	Dr P. Doherty, AIMS	Project 4.8.2 AIMS Doherty, P. (2007) October Milestone Report
Project 4.8.2	Dr P. Doherty, AIMS	Project 4.8.2 AIMS Doherty, P. (2007) September Milestone Report
Project 4.8.2	Dr P. Doherty, AIMS	Project 4.8.2 AIMS Doherty, P. (2008) September Milestone Report
Project 4.8.3	Dr C. Simpfendorfer, JCU	Project 4.8.3 JCU Simpfendorfer, C. (2009) March Milestone Report
Project 4.8.3	Dr M. Heupel, JCU	Project 4.8.3 JCU Heupel, M. et al. (2009) The Comparative Biology of Lutjanid Species on the Great Barrier Reef
Project 4.8.3	Dr C. Simpfendorfer, JCU	Project 4.8.3 JCU Simpfendorfer, C. (2007) June Milestone Report 2007
Project 4.8.3	Dr C. Simpfendorfer, JCU	Project 4.8.3 JCU Simpfendorfer, C. (2007) Harvest patterns of the 'Other Species' quota group in the Coral Reef Fin Fish Fishery
Project 4.8.4	Dr A. Tobin, JCU	Project 4.8.4 JCU Tobin, A. (2009) March Milestone Report
Project 4.8.4	Dr A. Tobin, JCU	Project 4.8.4 JCU Tobin, A. (2008) December Milestone Report
Project 4.8.4	Dr A. Williams, JCU	Project 4.8.4 JCU Williams, A. (2007) December Milestone Report
Project 4.8.4	Dr C. Simpfendorfer, JCU	Project 4.8.4 JCU Simpfendorfer, C. (2008) June Milestone Report
Project 4.8.5	Dr Steve Sutton, JCU.	Project 4.8.5 JCU Sutton, S. Recreational Fishers' Perceptions About the Costs and Benefits of the 2004 Great Barrier Reef Marine Park Zoning Plan
Project 4.8.5	Dr S. Sutton, JCU	Project 4.8.5 JCU Sutton, S. (2007) June Milestone Report 2007
Project 4.8.5	Dr S. Sutton, JCU	Project 4.8.5 JCU Sutton, S. (2007) Assessment of the Influence of the 2003 Great Barrier Reef Zoning Plan on use of the Great Barrier Reef
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2009) February Milestone Report
Project 4.8.6	Dr A. Birtles, JCU	Project 4.8.6 JCU Birtles, A. (2008) June Milestone Report
Project 4.8.6	Dr A. Birtles, JCU	Project 4.8.6 JCU Birtles, A. (2007) June Milestone Report – Co-investment Component
Project 4.8.6	Dr A. Birtles, JCU	Project 4.8.6 JCU Birtles, A. (2007) June Milestone Report
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism: Establishment of Visitor Monitoring Structure
Project 4.8.6	Prof. B. Prideaux, JCU	Projects 4.8.6/4.9.2 JCU Coghlan, A. (2007) Tourism and Recreation in North Queensland's World Heritage Areas (Poster)
Project 4.8.6	Dr A. Coghlan, JCU	Project 4.8.6 JCU Coghlan, A. and Prideaux, B. (2008) Reef Tourism First Yearly Report: November 2006 – October 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Communication Activities for 2009
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) November Milestone Report



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Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Coghlan, A. et al. 2008 Welcome to the Wet Tropics: The importance of weather in reef tourism (PowerPoint slides)
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Townsville – Quarter 1 – Nov 2006 to Jan 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 1 – Nov 2006 to Jan 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Great Barrier Reef – Quarter 1 – Nov 2006 to Jan 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Whitsundays – Quarter 1 – Nov 2006 to Jan 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Townsville – Quarter 2 – Feb to Apr 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 2 – Feb to Apr 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Great Barrier Reef – Quarter 2 – Feb to Apr 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Whitsundays – Quarter 2 – Feb to Apr 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Townsville – Quarter 3 – May to Jul 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 3 – May to Jul 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Great Barrier Reef – Quarter 3 – May to Jul 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2007) Reef Tourism Barometer for the Whitsundays – Quarter 3 – May to Jul 2007
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Townsville – Quarter 1 (Year 2) – Jan to Mar 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 1 (Year 2) – Jan to Mar 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Great Barrier Reef – Quarter 1 (Year 2 ) – Jan to Mar 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Whitsundays – Quarter 1 (Year 2) – Jan to Mar 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Townsville – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Southern Great Barrier Reef – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Great Barrier Reef – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Whitsundays – Quarter 2 (Year 2) – Apr to Jun 2008





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Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 3 (Year 2) – Jul to Sept 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Southern Great Barrier Reef – Quarter 3 (Year 2) – Jul to Sept 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Great Barrier Reef – Quarter 3 (Year 2) – Jul to Sept 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Whitsundays – Quarter 3 (Year 2) – Jul to Sept 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Southern Great Barrier Reef – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Great Barrier Reef – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Whitsundays – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for Cairns and Port Douglas – Quarter 1 (Year 4) – Jan to Mar 2009
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Great Barrier Reef – Quarter 1 (Year 4) – Jan to Mar 2009
Project 4.8.6	Prof. B. Prideaux, JCU	Project 4.8.6 JCU Prideaux, B. (2008) Reef Tourism Barometer for the Whitsundays – Quarter 1 (Year 4) – Jan to Mar 2009
Project 4.8.7	Prof. M. Kingsford, JCU	Project 4.8.4 JCU Simpfendorfer (2008) June Milestone Report
Project 4.8.7	Prof. M. Kingsford, JCU	Project 4.8.7 JCU Kingsford, M. (2007) Final Milestone Report
Project 4.8.8	Ms A. Penny, JCU	Fact Sheet – Great Barrier Reef Tourism Fact Sheet - Trends in Tourism
Project 4.8.8	Ms A. Penny, JCU	Fact Sheet – Great Barrier Reef Tourism Fact Sheet - How Weather Influences Reef Experiences
Project 4.8.8	Ms A. Penny, JCU	Fact Sheet – Bleaching Alert for the Northern Great Barrier Reef
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2007) A Sustainable Great Barrier Reef – Research News from MTSRF's Program 8 (Edition 1, May 2007)
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2007) A Sustainable Great Barrier Reef – Research News from MTSRF's Program 8 (Edition 2, July 2007)
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2007) Great Barrier Reef Research News (Edition 3, December 2007)
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2008) Great Barrier Reef Research News (Edition 4, April 2008)
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2008) Great Barrier Reef Research News (Edition 5, August 2008)
Project 4.8.8	Ms A. Penny, JCU	Project 4.8.8 JCU Penny, A. (2007) Fishing and Fisheries Research Centre Flyer
Project 4.9.1	Associate Prof. S. Turton, JCU	Project 4.9.1 JCU Turton, S. (2008) October Milestone Report



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Project 4.9.1	Dr R. Hill, CSIRO	Project 4.9.1 CSIRO Hill, R. (2008) Indigenous Cultural Actions Workshop Report.\
Project 4.9.1	Dr M. Wood, JCU	Project 4.9.1 Wood, JCU. (2007) October Milestone Report
Project 4.9.1	Dr M. Wood, JCU	Project 4.9.1 JCU Wood, M (2007) Final Milestone Report
Project 4.9.1	Dr M. Fuary	Project 4.9.1 JCU Fuary, M. (2008) Report 2B: An evaluation of previous and current methods and models for researching indigenous land use and purposes, with recommendations for best practice research solutions
Project 4.9.2	Dr J. Carmody, JCU	Project 4.9.2 JCU Carmody, J. (2009) Community Attitudes, Knowledge, Perceptions and Use of the Wet Tropics of Queensland World Heritage Area: Summary of Community Survey Results
Project 4.9.2	Dr K. McNamara, JCU	Project 4.9.2 JCU McNamara, K. (2009) Visitors' Interest in Walking Trails and Self-Drive Trips within the Wet Tropics of Queensland World Heritage Area
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 01 – Visitors who visited the Great Barrier Reef (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 02 – Visitors who visited the Wet Tropics rainforests (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 03 – Visitors who stayed in a hotel/motel (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 04 – Visitors who stayed in a holiday apartment / unit (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 05 – Visitors who stayed in a backpackers' hostel (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 06 – Visitors who travelled to Atherton (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 07 – Visitors who travelled to Mission Beach (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 08 – Visitors who travelled to Port Douglas (Jan-Dec 2007)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 09 – Solo female visitors (Jan-Sep 2008)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 10 – Service quality (Jan-Sep 2008)
Project 4.9.2	Dr K. McNamara, JCU	TNQ Tourism Factsheet 11 – Repeat visitors (Jan-Sep 2008)
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Carmody, J. (2008) Rainforest Tourism Newsletter – Research News from MTSRF's Program 9 (Issue 2, December 2008)
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Falco, F. (2007) Rainforest Tourism Newsletter - Research News from MTSRF's Program 9 (Issue 1, June 2007)
Project 4.9.2	Prof. B. Prideaux, JCU	Projects 4.9.2 JCU Coghlan, A. (2007) Tourism and Recreation in North Queensland's World Heritage Areas (Poster)
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism: Establishment of a visitor monitoring structure
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 1 (Year 1) – Nov 2006 to Jan 2007



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Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 1 (Year 1) – Nov 2006 to Jan 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 2 (Year 1) – Feb to Apr 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 2 (Year 1) – Feb to Apr 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 3 (Year 1) – May to Jul 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 3 (Year 1) – May to Jul 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 4 (Year 1) – Aug to Oct 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2007) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 4 (Year 1) – Aug to Oct 2007
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 1 (Year 2) – Jan to Mar 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 1 (Year 2) – Jan to Mar 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 2 (Year 2) – Apr to Jun 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 3 (Year 2) – Jul to Sep 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 3 (Year 2) – Jul to Sep 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2008) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 4 (Year 2) – Oct to Dec 2008
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2009) Rainforest Tourism Barometer (Rainforest Survey) – Quarter 1 (Year 3) – Jan to Mar 2009
Project 4.9.2	Prof. B. Prideaux, JCU	Project 4.9.2 JCU Prideaux, B. (2009) Rainforest Tourism Barometer (Airport Exit Survey) – Quarter 1 (Year 2) – Jan to Mar 2009
Project 4.9.3	Prof. S. Turton, JCU	Project 4.9.3 JCU Turton, S. (2008) June Milestone Report
Project 4.9.3	Prof. S. Turton, JCU	Project 4.9.3 Turton, S and Dale, A. (JCU/CSIRO/Terrain) An assessment of the environmental impacts of Cyclone Larry on the forest landscapes of northeast Queensland, with reference to responses to natural resource management issues in the aftermath
Project 4.9.4	Dr J. Herbohn, UQ	Project 4.9.4 UQ Emtage, N. (2007) December Milestone Report.





MTSRF Project	Project Leader OR Lead Author, Institute	Title of Website Link
<b>Project 4.9.5</b>	Dr J. Kanowski, GU	<p>"Dynamics and Restoration of Australian Tropical and Subtropical Rainforests"</p> <p>Webpage summary links to book chapter download:</p> <p>Kanowski, J, Kooyman, R. M. and Catterall, C. P. (2009) Dynamics and Restoration of Australian Tropical and Subtropical Rainforests. In: Hobbs, R. J. and Suding, K. N. (eds) <i>New Models for Ecosystem Dynamics and Restoration</i>. Island Press, Washington DC.</p>
<b>Project 4.9.5</b>	Associate Prof. C. Catterall, GU Dr J. Kanowski, GU	<p>Microsoft Excel spreadsheet designed to accompany "Monitoring Revegetation Projects for Biodiversity in Rainforest Landscapes – Toolkit Version 1, Revision 1", available from: <a href="http://www.rrrc.org.au/publications/research_reports.html">www.rrrc.org.au/publications/research_reports.html</a></p>
<b>Project 4.9.5</b>	Associate Prof. C. Catterall, GU Dr J. Kanowski, GU	<p>Microsoft Word version of the proformas used in "Monitoring Revegetation Projects for Biodiversity in Rainforest Landscapes – Toolkit Version 1, Revision 1" to enable the user to keep records of on-ground works carried out at revegetated sites and to monitor 'basic indicators' of biodiversity, available from: <a href="http://www.rrrc.org.au/publications/research_reports.html">www.rrrc.org.au/publications/research_reports.html</a></p>
<b>Project 4.9.5</b>	Dr C. Catterall, GU	Project 4.9.5 GU Catterall, C. (2007) November Milestone Report
<b>Project 4.9.6</b>	Dr A. Coggan, CSIRO	Program 9 CSIRO Coggan, A. and Jess, M. (2008) Thinking Offsets in FNQ – Workshop Outcomes
<b>Project 4.9.6</b>	Dr C. Robinson, CSIRO	Project 4.9.6 CSIRO Robinson, C. (2008) December Milestone Report
<b>Project 4.9.7</b>	Associate Prof. M. Cuthill, UQ	Project 4.9.7 UQ Cuthill, M. (2008) Reporting social outcomes of development: An analysis of diverse approaches
<b>Project 4.9.7</b>	Dr K. Maclean, UQ	Project 4.9.7 UQ Maclean, K. et al. (2008) Regional Level Indicators of Social Resilience
<b>Project 4.9.7</b>	K. Alexandridis, CSIRO	Project 4.9.7 CSIRO Alexandridis, K. (2007) Monte Carlo Extreme Event Simulations for Understanding Water Quality Change Classifications in the Great Barrier Reef Region.
<b>Project 4.9.7</b>	Dr M. Gooch, JCU	Project 4.9.7 JCU Gooch, M. (2007) Literature and lay reviews of community resilience to changes in water quality - Phase one of Townsville/Thuringowa Case Study
<b>Project 4.9.7</b>	Dr M. Gooch, JCU	Project 4.9.7 Maclean, K. (2008) Research Update February Newsletter.
<b>Project 5.10.2</b>	TTNQ	<p>Project 5.10.2 TTNQ (2008) Theme 1 Status of the Ecosystems Fact Sheet: <a href="http://www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-1-Fact-Sheet.pdf">www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-1-Fact-Sheet.pdf</a></p>
<b>Project 5.10.2</b>	TTNQ	<p>Project 5.10.2 TTNQ (2008) Theme 2 Risks and Threats to the Ecosystems Fact Sheet: <a href="http://www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-1-Fact-Sheet.pdf">www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-1-Fact-Sheet.pdf</a></p>
<b>Project 5.10.2</b>	TTNQ	<p>Project 5.10.2 TTNQ (2008) Theme 3 Halting and Reversing the Decline of Water Quality Fact Sheet: <a href="http://www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-3-Fact-Sheet.pdf">www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-3-Fact-Sheet.pdf</a></p>
<b>Project 5.10.2</b>	TTNQ	<p>Project 5.10.2 TTNQ (2008) Theme 4 Sustainable Use and Management Fact Sheet: <a href="http://www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-4-Fact-Sheet.pdf">www.rrrc.org.au/publications/downloads/5102-TTNQ-2008-Theme-4-Fact-Sheet.pdf</a></p>

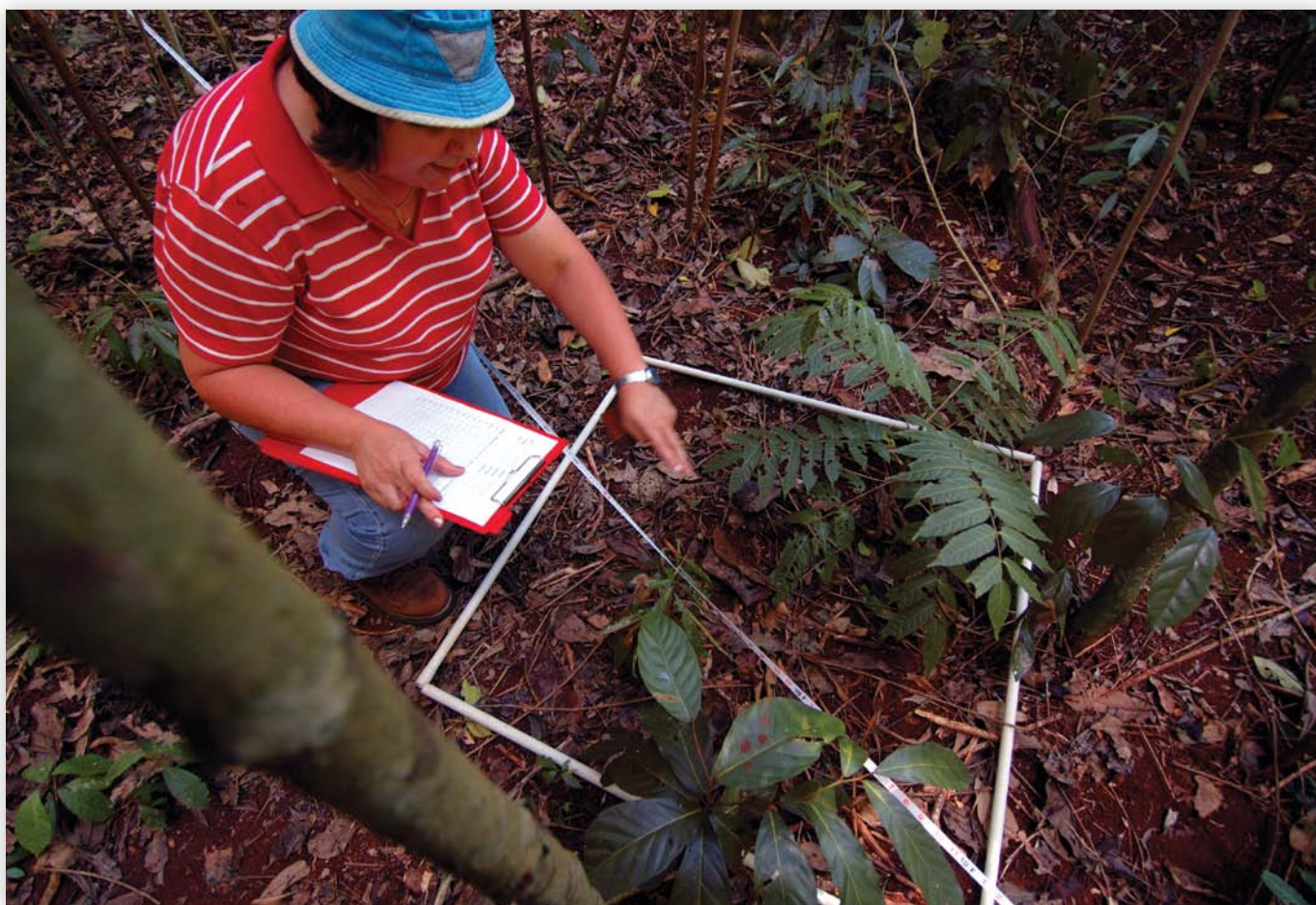
## Abbreviations

<b>AIMS</b>	Australian Institute of Marine Science
<b>APVMA</b>	Australian Pesticides and Veterinary Medicines Authority
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>DEEDI</b>	Queensland Department of Employment, Economic Development and Innovation
<b>DERM</b>	Queensland Department of Environment and Resource Management
<b>DEWHA</b>	Department of Environment, Water, Heritage and the Arts
<b>DIISR</b>	Department of Innovation, Industry, Science and Research
<b>DRET</b>	Department of Resources, Energy and Tourism
<b>GBR</b>	Great Barrier Reef
<b>GBRMP</b>	Great Barrier Reef Marine Park
<b>GBRMPA</b>	Great Barrier Reef Marine Park Authority
<b>GU</b>	Griffith University
<b>JCU</b>	James Cook University
<b>MTSRF</b>	Marine and Tropical Sciences Research Facility
<b>NHT</b>	Natural Heritage Trust
<b>NRM</b>	Natural Resource Management
<b>QPWS</b>	Queensland Parks and Wildlife Service
<b>RCA</b>	Reef Check Australia
<b>RRRC</b>	Reef and Rainforest Research Centre
<b>TSRA</b>	Torres Strait Regional Authority
<b>TTNQ</b>	Tourism Tropical North Queensland
<b>UNSW</b>	University of New South Wales
<b>UQ</b>	University of Queensland
<b>WTMA</b>	Wet Tropics Management Authority
<b>WWF</b>	World Wildlife Fund





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## How to engage with the MTSRF

As a publicly-funded body, the MTSRF has a responsibility to the community to ensure that the results of research projects are widely available. Your first port of call should be the MTSRF website ([www.rrrc.org.au/MTSRF](http://www.rrrc.org.au/MTSRF)), which provides access to an enormous range of technical, interpreted and media-ready information, covering the full spectrum of MTSRF research. For further information or to discuss future engagement opportunities, please contact the MTSRF via the Reef and Rainforest Research Centre, in either the Cairns or Townsville offices.

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[www.environment.gov.au/programs/cerf/index.html](http://www.environment.gov.au/programs/cerf/index.html)**



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