National Environmental Research Program

NERP Tropical Ecosystems Hub

Science Communication Plan

Version 5 December 2011

Prepared by the
Reef & Rainforest Research Centre

Contents

Acronyms

ABRS ..... Australian Biological Resources Study

AFMA ..... Australian Fisheries Management Authority

AIMS ..... Australian Institute of Marine Science

AMPTO ..... Association of Marine Park Tourism Operators

ANU ..... Australian National University

AQIS ..... Australian Quarantine and Inspection Service

ATH ..... Australian Tropical Herbarium

AWP ..... Annual Work Plan

BOM ..... Bureau of Meteorology

CAFNEC ..... Cairns and Far North Environment Centre

CERF ..... Commonwealth Environment Research Facilities

CSIRO ..... Commonwealth Scientific and Industrial Research Organisation

CVA ..... Conservation Volunteers Australia

CYPRSCAC ..... Cape York Peninsula Region Scientific and Cultural Advisory Committee

DAFF ..... Department of Agriculture, Fisheries and Forestry

DEEDI ..... Department of Employment, Economic Development and Innovation

DERM ..... Department of Environment and Resource Management

DFAT ..... Department of Foreign Affairs and Trade

DLGP ..... Department of Local Government and Planning

DPC ..... Department of the Premier and Cabinet

DSEWPaC ..... Department of Sustainability, Environment, Water, Population and Communities

FNQROC ..... Far North Queensland Regional Organisation of Councils

FRDC ..... Fisheries Research and Development Corporation

FTE ..... Full-time Equivalent

GBR ..... Great Barrier Reef

GBRMPA ..... Great Barrier Reef Marine Park Authority

GU ..... Griffith University

IG ..... Implementation Groups

JCU ..... James Cook University

MEP ..... Monitoring and Evaluation Plan

MLA ..... Meat and Livestock Australia

MTSRF ..... Marine and Tropical Sciences Research Facilities

MYRP ..... Multi-Year Research Plan

NARP ..... National Adaptation Research Plan

NERP ..... National Environmental Research Program

NGOs..... Non-Government Organisations

NQ..... North Queensland

NRM..... Natural Resource Management

QSIA ..... Queensland Seafood Industry Association

TE ..... Tropical Ecosystems

TERN ..... Tropical Ecosystem Research Network

TSIRC..... Torres Strait Island Regional Council

TSRA..... Torres Strait Regional Authority

TTNQ..... Tourism Tropical North Queensland

UQ..... University of Queensland

WA DEC..... Western Australia Department of Environment and Conservation

WTMA..... Wet Tropics Management Authority

WWF ..... World Wide Fund for Nature

1. Introduction

1.1. Introduction to the National Environmental Research Program (NERP)

The National Environmental Research Program (NERP) is an Australian Government program that provides funding for applied public good research. It builds on the Commonwealth Environment Research Facilities (CERF) program with a specific focus on biodiversity.

The program's objective is: *To improve our capacity to understand, manage and conserve Australia's unique biodiversity and ecosystems through the generation of world-class research and its delivery to Australian environmental decision makers and other stakeholders.*

NERP focuses on biodiversity research and delivering information that the Australian Government and other stakeholders[1] need to better inform environmental management, policy and decision making, both in the short-term and into the future. This includes understanding how ecosystems function, monitoring their health, maintaining and building their resilience, using them sustainably and exploring how to better use markets to protect biodiversity.

The NERP seeks to achieve its objectives by supporting applied research that:

- Has a strong public-good focus and public-good outcome;
- Is research-user focused and addresses the needs of the Australian Government and other stakeholders in developing evidence-based policy to improve management of the Australian environment;
- Is highly innovative and aims to achieve world-class research;
- Enhances Australia's environmental research capacity;
- Is collaborative and builds critical mass by drawing on multiple disciplines from multiple research institutions to address challenging research questions;
- Provides results accessible to government, industry and the community; and
- Includes a focus on synthesis and analysis of existing knowledge.

Five large multi-institutional research hubs have been established to examine biodiversity issues in terrestrial, freshwater and marine ecosystems across Australia.

Further information is available at:
http://www.environment.gov.au/biodiversity/science/nerp/index.html

[1] Throughout this document, 'stakeholders' refers to any individuals or agencies with an interest in NERP TE Hub research; the more specific 'research-users' refers to that subsection of stakeholders whose uptake and use of NERP TE Hub research products is essential for the successful achievement of the Hub's objectives.

1.1.1. The NERP Knowledge Brokering and Communications Strategy

The NERP Knowledge Brokering and Communications Strategy[2] was developed by the Department in consultation with science leaders and knowledge brokers from all of the Hubs. The Strategy states that each NERP Hub must develop its own Science Communication Plan that is consistent with the overarching Strategy.

1.2. Overview of the NERP Tropical Ecosystems Hub (NERP TE Hub)

The National Environmental Research Program (NERP) is an Australian Government program that provides funding for applied public good research. The NERP Tropical Ecosystems (TE) Hub will build on a $25.8m investment from the Australian Government through the National Environmental Research Program to deliver $61.9m of research for the Great Barrier Reef (GBR), Torres Strait and tropical rainforests of North Queensland. The Hub's mission is to deliver world-class research and shared knowledge for the benefit of the three geographic Nodes (GBR, Torres Strait and rainforests).

The mission of the Hub is to deliver research that supports evidenced-based policy, management, and decision-making by the Australian Government and other key research-users. The Hub is a partnership between research providers (core group AIMS, CSIRO, JCU, UQ; others ANU, GU) and a diverse range of research-users including government agencies (Federal, State), management authorities (GBRMPA, TSRA, WTMA), NRM bodies, conservation NGOs, regional industries and Indigenous groups.

The Hub builds on five years of 'public good' environmental research supported through the Marine and Tropical Sciences Research Facility (MTSRF). The MTSRF was a large investment by the Commonwealth Environmental Research Facilities (CERF) program funded by the Australian Government through the former Department of the Environment, Water, Heritage and the Arts. The MTSRF program was built on the foundation of 13 years of prior tropical research supported by the Cooperative Research Centre Program, which funded Cooperative Research Centres for the reef (GBR, Torres Strait) and Wet Tropics rainforests. As in these previous programs, the NERP TE Hub will benefit from significant co-investment from research providers and other agencies.

These successive research programs have sought to improve regional environmental decision making and inform national, state and regional stakeholders through better understanding of:

- The status and future trends of key species and ecosystems in northern Queensland;
- The social and economic interactions between northern Queensland communities and their regional environmental assets;
- The performance of existing management arrangements against their targets; and
- The options for adaptation and new management approaches to enhance ecological and social resilience in a changing environment.

[2] http://www.environment.gov.au/biodiversity/science/nerp/publications/pubs/nerp-communications-strategy.pdf

The more complex of these issues requires combining new knowledge from multiple disciplines, particularly the fusion of social, economic, and biophysical sciences. They also require sharing knowledge among many different groups (e.g. researchers, managers, research-users, Indigenous communities). Since most of the problems require local solutions, these are best developed and delivered through regional networks that overcome the capacity constraints in individual institutions in northern Queensland. In addition to the challenging goal of developing and delivering useful information for the benefit of diverse research-users, the TE Hub as a coordinating mechanism also builds capability through providing opportunities for collaborative multi-disciplinary networks; thus enhancing the capacity for future research to lead directly to improved environmental outcomes. The latter requires the research-users of this new knowledge to be engaged throughout the process from the early stages of problem definition to the implementation of new practices and/or the uptake into new policy.

From the outset it has been clear that the success of the Hub will be measured not only by the achievements of the research portfolio, but also by the effectiveness of engagement and knowledge transfer as evidenced by uptake of NERP science by research-users.

The strategic goals of the NERP Tropical Ecosystem Hub are to improve understanding and delivery of knowledge relating to:

1. **Monitoring condition and trend in natural resources**: Understanding the condition, trend and interdependencies of unique environmental assets of northern Queensland; building the capacity to predict the future for these resources.
2. **Understanding the impacts of cumulative pressures on ecosystem function:** Understanding how ecosystems and biodiversity respond to cumulative pressures; determining the ecological, social and economic implications for northern Queensland.
3. **Managing for resilient tropical systems:** Partnering with key environmental decision-makers in government, industry and community to develop information, systems and tools to support implementation of ecologically sustainable management; preserving environmental values while strengthening social resilience to future change.
4. **Delivering an effective and efficient program**: Implementing a cost-effective program by ensuring a clear governance framework is supported by effective systems and efficient processes that deliver: world-class science; timely results; value for money; clear pathways for adoption of new information by all engaged research-users.

The structure of the Hub Science Program is outlined schematically in Figure 1 (See Appendix 1 and the NERP TE Hub Multi-Year Research Plan[3] for details about specific projects). Some of the ways by which the Hub's program and structure will lead to the achievement of its mission (i.e. 'pathways to impact') are indicated in Figure 2.

[3] http://www.environment.gov.au/biodiversity/science/nerp/publications/pubs/tropical-ecosystems-myrp.pdf

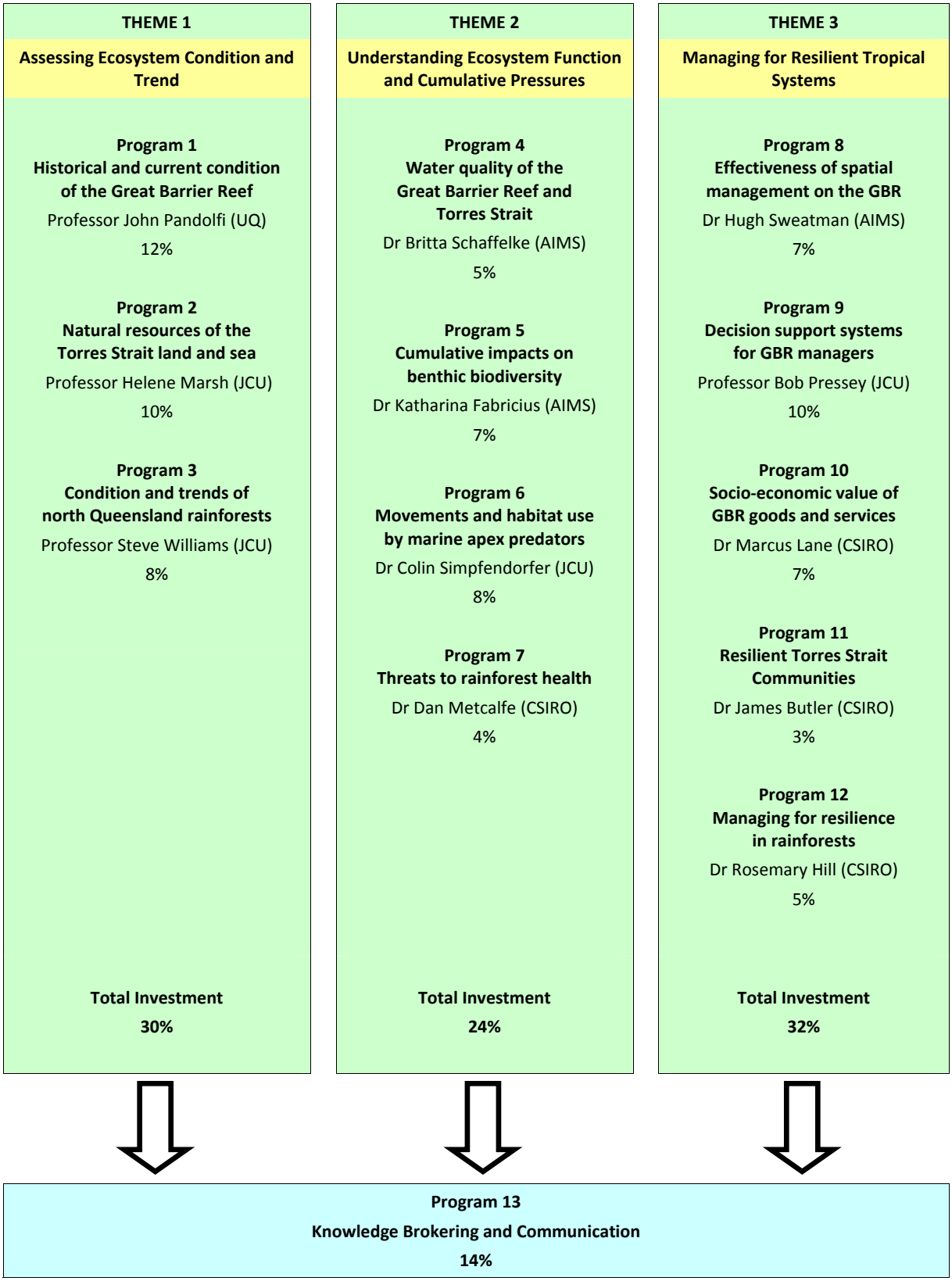

Figure 1. Themes and Programs of the NERP TE Hub showing Program Leaders (institutional affiliation) and relative investment in each. See Appendix 1 for the full list of projects.

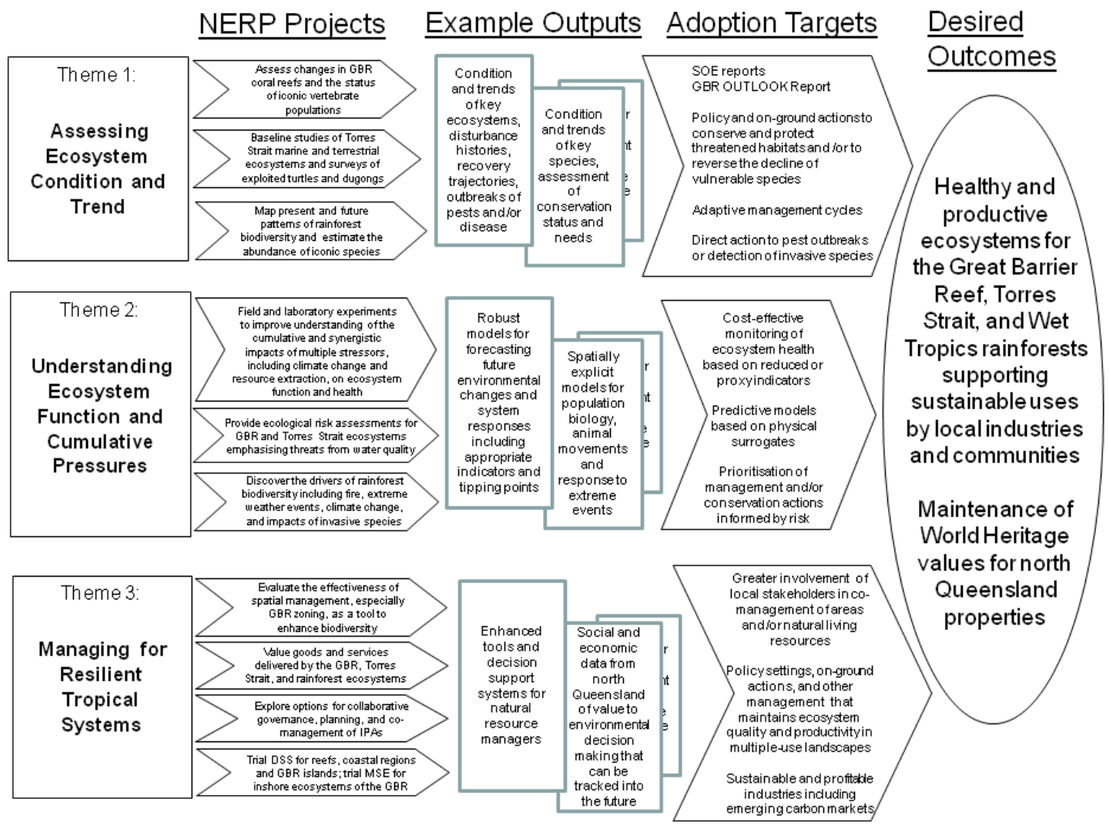

Figure 2. Potential pathways to adoption for NERP TE Hub research.

1.3. Objectives of this Science Communication Plan

The overall objective of the NERP TE Hub is to deliver research that strengthens the capacity of the Australian Government and other stakeholders to make informed decisions on environmental matters. Implementation of an effective and efficient plan for delivery of information to stakeholders (this NERP TE Hub Science Communication Plan) is therefore fundamental to the Hub's success.

The specific objectives of the NERP TE Hub Science Communication Plan are to promote and facilitate the influential application of Hub-generated knowledge in policy, planning and management in relation to the Great Barrier Reef, Wet Tropics Rainforests and Torres Strait, and related ecosystems, through:

- Facilitating effective two-way engagement between researchers and research-users;
- Delivering timely and targeted information to research-users in forms that are accessible, useful and culturally appropriate;
- Monitoring and evaluating the success of knowledge brokering and communications activities, such that their efficiency and effectiveness can be increased over time; and
- Establishing arrangements relating to data custodianship and other legacy issues so that Hub outputs are well known and accessible long after the initial funding period.

1.3.1. Guiding principles

The key principles underlying the development and operationalisation of this Science Communication Plan are:

- To make all Hub-generated research readily and freely available to all, including the general public;
- To utilise existing networks and collaborate with existing programs, wherever feasible, to avoid duplicating effort;
- To ensure distribution of Hub science communication resources is equitable and reaches the widest possible group of NERP TE Hub stakeholders, in as much as that is feasible given their diversity of needs and capacities; and
- To ensure 'no surprises' to NERP TE Hub stakeholders by alerting them to impending communications from the Hub relevant to their business. Automated functions on the NERP TE Hub website will be exploited to make this process as efficient and failsafe as possible.

This Science Communication Plan has been designed to be implemented in the context of the other documents that direct the activities of the NERP TE Hub, namely the Multi-Year Research Plan (MYRP), Annual Work Plans (AWP), and the Monitoring and Evaluation Plan. It is a strategic statement of the principles that will guide our communications rather than a detailed operations manual, because we will learn as we go and strive for continuous improvement. The Monitoring and Evaluation Plan (MEP link) will describe the learning cycle.

2. Plan for efficient, cost-effective achievement of the objectives

The NERP TE Hub is the largest and most complex of the NERP Hubs. It builds on a history of successful environmental research in the regions and seeks to deliver to sophisticated research-users who have engaged with similar programs in the past and increasingly are setting the agenda for determining research relevance and workable knowledge transfer systems as new programs arise. In recognition of this, the NERP TE Hub Multi-Year Research Program was selected from a much broader range of offerings from research providers by regional working groups that included a diverse range of stakeholders.

The approved projects will be monitored and reviewed on a bi-annual basis by Implementation Groups that will include key research-users for the research outputs. These groups will also help to shape the communications strategy for each piece of research in order to maximize the opportunity for uptake.

The importance of effective science communication (including engagement and knowledge transfer components) to the successful achievement of the NERP TE Hub's objectives is reflected in the allocation of more than 10% of all new funds to these activities.

2.1. Summary of findings from stakeholder consultation process

During the development of this Plan, NERP TE Hub stakeholders were consulted about their needs and expectations regarding engagement in the knowledge brokering and communications activities of the Hub. The diversity of views expressed (see summary in Appendix 2), some of which contradict, has been used to guide the structure and detail of this Science Communication Plan. The major areas of initial consensus included the need for a formal engagement mechanism, the need for a flexible and diverse Plan that could manage the differing needs and capacities of stakeholders, and the need to avoid duplication of existing stakeholder relationships and networks. Major areas requiring discussion before consensus could be reached included the precise nature of the Hub's formal engagement mechanism, the best model for delivery given the diversity of views and needs, and roles and responsibilities for engagement and knowledge transfer.

2.2. Mechanisms for engagement and knowledge transfer

2.2.1. Building on existing relationships and networks

All activities will seek to employ existing relationships, systems and dissemination networks wherever these are available. Given that the NERP TE Hub will operate in three regions each serviced by an established management agency with legislated authority (GBRMPA, TSRA, WTMA), the key to uptake into their decision making will be effective engagement mechanisms and the generation of useful knowledge. Each of these Authorities has its own consultative groups for engagement with regional stakeholders and communication mechanisms with substantial capacity for outreach. The

NERP TE Hub will provide knowledge and products to these networks but with recognition that it will be just one more source of information in a broad flow with little control over the message. While this will work well for many situations, including communication with general audiences, there are other regional stakeholders beyond the Authorities that are included in our target audiences. These include, but are not limited to, other agencies of the Queensland and Australian Governments, industry bodies, and NGOs (NRM, conservation groups and Indigenous communities).

The NERP TE Hub is in the business of researching some of the most complex and challenging problems of the human interaction with the environment. The research providers, as co-investors, demand that the science is rigorous and intellectually challenging as well as directly relevant to societal needs. As a result, the outputs of some of the best research may be tentative (requiring further validation), partial, or ambiguous and it is essential that the path between researcher and user is not too long or filtered. Especially in such cases, the Hub will seek to use relatively short pathways to adoption by working closely with research-users.

2.2.2. Facilitating new relationships and networks

As well as building on existing mechanisms for engagement and knowledge transfer, new relationships and networks will be facilitated between researchers and research-users using a range of Hub-wide and project-specific mechanisms. All activities will be planned and undertaken in the context of achieving the Hub's Science Communication objective of increasing the potential for uptake and influence.

2.2.2.1. Hub-wide mechanisms

2.2.2.1.1. Steering Committee

The Steering Committee's primary function is to oversee the development and implementation of the Multi-Year Research Plan, including annual consideration of the Research Plan, evaluating progress and reporting to the Department and Minister as required. Overseeing the development and delivery of the Science Communication Plan is part of this function. In addition, the Committee provides advice to DSEWPaC on the coordination of research, knowledge brokering and uptake of science relevant to the scope of the Tropical Ecosystems Hub. Its membership includes an independent chair and senior representatives of DSEWPaC, TSRA, GBRMPA, Queensland Department of the Premier and Cabinet, WTMA, AMPTO, QSIA, Infofish Australia, WWF, Terrain NRM and the Hub's four major research providers. The Steering Committee meets as required, but at least biannually to coincide with the Hub's reporting and output requirements.

2.2.2.1.2. Implementation Groups[4]

The primary function of the Implementation Groups is to maintain close working contact between research-users and researchers. Group membership will be carefully chosen to include research-

[4] This terminology has been adopted to distinguish these operations committees from the three Node Working Groups that facilitated delivery of the Hub's MYRP and AWP during the initial planning phase.

users with a direct interest in the outcomes of the research to be attempted. While there will be a desire to be inclusive, the group size must be small enough to be manageable and efficient.

Implementation groups will be formed around clusters of similar research projects defined by shared features like topic (e.g. water quality) or focus (e.g. Torres Strait). Table 1 shows how 38 approved science projects have been allocated to four Implementation Groups (considered the minimum number). The details of each group are provided in Appendix 4.

Each Implementation Group will be chaired by a person appointed by the Steering Committee. In most cases, the Chair will be a representative of a major research user such as one of the three management authorities (GBRMPA, TSRA, WTMA).

Each Implementation Group will follow a common schedule of meeting twice a year (2nd Qtr, 4th Qtr) starting the 4th Qtr of 2011. The first meeting will be face-to-face and the major item of business will be for researchers and research-users to agree on the research milestones for each project covered by that Implementation Group. In the first year, the group will meet again six months later to review progress towards the early milestones. The first meeting of the second year will also be face-to-face and the major item of business will be to identify the 'pathway to adoption' for each project covered by that Implementation Group. The second meeting of the second year will review progress towards the research milestones. Both meetings in the third year should be face-to-face. The first will review progress on research and agree upon specific knowledge transfer actions consistent with the agreed pathway to adoption. The second in the 2nd Qtr of 2013 will evaluate the progress of each project towards achievement of its research milestones and will provide that advice in a report to the Science Leader. In addition, the Group will review progress towards the planned knowledge transfer. The final meeting of the Implementation Group will occur in 4th Qtr of 2014. Ideally this should also be a face-to-face meeting and the major item of business will be to review the final reports from each project and to analyse the learnings from the conduct of that project (*What worked? What didn't? What could have been done better?*).

From this description of responsibilities, the Implementation Groups will provide major support to the Science Leader to ensure that the NERP TE Hub delivers a research program of quality and impact as well as the aspirations of the Science Communication Plan. For this role, each Implementation Group will be modestly resourced from the Communications and Knowledge Brokering budget to facilitate the participation of non-government research users and cover the direct costs of meetings.

Table 1. Assignment of approved projects to Implementation Groups.

Project No.	Project Leader	Program Leader	Torres Strait	Rainforest biodiversity	GBR Water Quality	GBR - Biodiversity, Health, Protection & Management
1.1	H. Sweatman	Pandolfi				Reef status & trends
1.2	Hamann & Marsh					Mammals & turtles
1.3	Pandolfi				Historical changes	
2.1	Hamann & Marsh	Marsh	Turtles & dugongs			
2.2	Burrows		Terrestrial & Freshwater			
2.3	Berkelmans		SST & reef monitoring			
3.1	Williams	Williams		Biodiversity drivers		
3.2	Crayn			Mountain top floras		
3.3	Puschendorf			Marginal frog habitats		
3.4	Westcott			Cassowaries & Flying Foxes		
4.1	Fabricius	Schaffelke			Turbidity	
4.2	Negri				Pesticides	
4.3	Brodie				WQ risks	
4.4	Brodie		WQ assessment			
5.1	De'ath	Fabricius			Biodiversity drivers	
5.2	Uthicke				Thresholds	
5.3	Collier				Seagrass	
6.1	Heupel	Simpfendorfer				Fish tracking
6.2	Simpfendorfer					Inshore sharks
6.3	Congdon					Seabird tracking
7.1	Metcalfe	Metcalfe		Fire impacts		
7.2	Murphy			Weeds & pigs		
7.3	Welbergen			Vulnerability		
8.1	Sweatman	Sweatman				Zoning impacts
8.2	Russ					Zoning impacts
8.3	Jones					Connectivity

Project No.	Project Leader	Program Leader	Torres Strait	Rainforest biodiversity	GBR Water Quality	GBR - Biodiversity, Health, Protection & Management
9.1	Anthony	Pressey				Bleaching risk maps
9.2	Dichmont					MSE: (fisheries)
9.3	Pressey					GBR Islands
9.4	Pressey					Coasts
10.1	Marshall	Lane				Soc Monitoring
10.2	Stoeckl					Econ/Soc Valuations
11.1	Butler	Butler	Communities			
11.2	Laurance		Biosecurity			
12.1	Hill	Hill		Indigenous		
12.2	Catterall			Restoration		
12.3	Stoeckl			Tourism values		
12.4	Dale			Carbon market		
13	Lawrey	Doherty	e-Atlas	e-Atlas	e-Atlas	e-Atlas

2.2.2.1.3. Workshops/conferences

Large annual conferences and smaller topic-based workshops differ in the style of engagement and suit different audiences. The NERP TE Hub Science Communication Plan envisions a mixture of both. Provision has been made in the Hub budget for three regional conferences in Cairns aimed at the widest possible audience. These are planned to take place in the 3rd Qtr of 2012, 2013, and 2014. The amount of budget required is known from the experience of staging similar events during the CERF Program.

Small workshops may occur at any time and will be initiated by requests from the Implementation Groups as part of the engagement and knowledge transfer plans for individual projects or groups of allied projects. No specific provision has been made in the budget for such workshops but requests will be analysed carefully and may be funded from a small amount of unallocated funds intended specifically for communication and knowledge transfer (see Section 4). Given the small size of this pool, initiatives for workshops will be restricted to $5K per application.

2.2.2.1.4. Website and e-Atlas

The NERP TE Hub website will be the public face of the Hub, and will provide not only basic information about research programs, results and activities, but access to a range of synthesised and interpreted material contributed by researchers, research providers, research-users and others as required. The website will fulfill two important objectives of the Hub – to make information publicly available in a timely fashion, and to provide a legacy for the Hub. The capacity of the website to efficiently host a regular e-newsletter for communications both within the Hub and externally may

be exploited. A full-time position funded from the Communications and Knowledge Brokering budget will be provided by the Hub Administrator to manage the website, generate and upload content (Section 4).

In the MTSRF Program, funding from the Hub was provided to develop an electronic Atlas product (e-Atlas) as the primary archive for MTSRF data and products. The e-Atlas is a website, mapping system and set of data visualisation tools for presenting research data in an accessible form to allow greater use of this information. Its primary goal is to store and provide knowledge for a wide range of users, such as awareness of past research at a given location or on a given topic. It is however much more than a database or a store of lists. The appeal and success of the e-Atlas derives from the simple and intuitive interfaces that make complex layers of information available without requiring GIS skills in the user. It is particularly well-suited to serving map visualisations of spatial data to support the work of environmental managers. The following links serve as illustrations:

Front page: http://e-atlas.org.au/

Dataset page: http://e-atlas.org.au/content/gbr-jcu-bathymetry-gbr100

Mapping system (showing water quality data): http://maps.e-atlas.org.au/mmp/

Article: http://e-atlas.org.au/content/relationship-between-corals-and-fishes-great-barrier-reef

A wide range of projects from all three Nodes of the NERP TE Hub are expected to generate spatial data suitable for visualization and easy comprehension. From the proposal descriptions, at least 22 of the 38 projects in the NERP TE Hub are in this category, with examples shown in Table 2.

The e-Atlas already stores metadata from all MTSRF projects and visual products from the GBR (with limited material from the Rainforest Program). Work has begun already on expanding the coverage of the e-Atlas to the lands and seas of the Torres Strait. In the early days, as the NERP TE Hub is establishing its research program, the e-Atlas will recover and archive as much missing legacy data from the MTSRF as can be delivered from the past research providers (e.g. suitable datasets from the Wet Tropics, CSIRO projects in Torres Strait). The TSRA is a strong supporter of the e-Atlas to be a primary tool for Torres Strait communities to find environmental information from their region. Its Land and Sea Management Unit will also be a major user of this information.

The utility of any information storage and retrieval system is only as powerful as the richness of its content. This places a premium upon the importance of rapid generation of content within the life of the Hub. It is anticipated that the person responsible for the NERP TE Hub website will work closely with the e-Atlas team to provide an additional resource for content generation.

Table 2. Projects that the e-Atlas could assist to deliver products useful for research-users during the life of the Hub, by Node*.

GBR Node	Torres Strait Node	Rainforest Node
Maps and GIS layers of status and trends of reef health across the GBR (1.1) Maps and GIS layers of COTS survey results (1.1) Maps and GIS layers of marine wildlife survey results (dugong, coastal dolphins) (1.2) Maps of water clarity for each NRM region (4.1) Maps of biodiversity and environments at optimal scales (5.1) Maps of main forms of environmental pressures, available as publication-quality vector graphics (5.1) Maps illustrating seagrass exposure to flood plumes (5.3) Maps of predator movements and habitat usage, including juvenile sharks (6.1) Maps of seabird foraging locations in breeding and non-breeding seasons (6.3) Maps of climatology and anomalies (6.3) Dynamic vulnerability maps of resilience and vulnerability (9.1) Maps of regional ecosystems, habitats and uses, including connectivity (9.4)	Dugong density maps and GIS layers (2.1) Maps and GIS layers showing change over time for coastal vegetation in the Torres Strait (2.2) Coral reef biodiversity maps plus interactive kiosks (2.3) Georeferenced datasets of pollutant sources relevant to Torres Strait (4.4)	Detailed maps showing past, current and future trends in rainforest biodiversity (3.1) Maps of plant taxonomic richness and phylogenetic diversity (3.2) Maps showing distribution and abundance of endangered frogs and other taxa (3.3) Maps showing distribution and prevalence of chytrid fungus (3.3) Maps illustrating population size and distribution for cassowaries and flying foxes (3.4) Maps illustrating cyclone impacts on glider habitat, rainforest invasion, and impacts of fire (7.1) High resolution maps of exposure to temperature extremes in-situ (7.3) Map identifying high-suitability areas for revegetation (12.2)

* This is in addition to basic metadata services which will be provided by the e-Atlas for every NERP TE Hub project.

2.2.2.1.5. Knowledge brokering, synthesis and publishing

Some stakeholders will need more assistance with engagement, knowledge brokering and interpretation than others if they are to successfully use information generated by the Hub's research projects. Therefore there is a need for provision and/or central coordination of knowledge brokering within the Hub. This will be supported by the appointment of a full-time knowledge broker who will be funded by the NERP TE Hub budget (Section 4) and accommodated with the web person within the offices provided by the Hub Administrator.

During the life of the NERP TE Hub, the focus of activities will shift from relationship building between researchers and research-users (first 1.5 years) to knowledge transfer. The latter will be supported by reserving approximately 1% of Hub funds for cost-effective initiatives recommended by the Implementation Groups (Section 4). This fund will also allow limited capacity to react to

emerging issues (for example, increasing the Hub's capacity to influence by generating and distributing plain-English materials relevant to currently controversial topics). Compared with the MTSRF Program, however, the NERP TE Hub will have little capacity to provide an editing or publishing service to researchers. The primary responsibility for the latter will reside with the researcher and their employing Institution.

2.2.2.1.6. Media

Central Hub services will be invested in developing specific features on a secure section of the NERP TE Hub website to facilitate efficient implementation of the NERP TE Hub media protocol (Appendix 6) by the communications units of stakeholder agencies and DSEWPaC. The Hub Science Leader is responsible for ensuring that these protocols are respected by all participants in the Hub.

2.2.2.2. Project-specific mechanisms

As requested by many NERP TE Hub stakeholders, communication of results of specific research projects will primarily be the responsibility of Program Leaders or Project Leaders, although the Hub-wide services outlined above will be available to facilitate or assist this process as appropriate. On the assumption that demand will exceed supply for Hub-wide services, the Science Leader will be responsible for allocating limited centrally-resourced effort.

2.2.2.2.1. Key products/messages per NERP TE Hub project

An analysis of the expected key products/messages and delivery mechanisms (and dependencies) for all NERP TE Hub projects is presented in Appendix 3.

2.2.3. Roles and responsibilities for science communication

In this context, science communication includes both engagement and knowledge transfer functions.

2.2.3.1. Science Leader

The Science Leader should be regarded as the primary 'public face' for the Hub and, together with research providers, the primary media contact. Other key functions in terms of science communication include:

- Public representation of the Hub to media and other stakeholders;
- Liaison with research providers and major research-users;
- Liaison with the other NERP Hubs to ensure cross-program collaboration and information sharing;
- Promotion of the Hub's work to research-users and the community;
- Final approval of media releases generated within the NERP TE Hub;
- Responsibility for ensuring that NERP TE Hub protocols governing matters relevant to science communication are followed, including taking remedial action if warranted by the results of annual assessments of engagement effectiveness; and

- Establishing links with stakeholder organisations and other research groups (including other NERP Hubs).

2.2.3.2. Program Leaders

Following the major roles expected of Implementation Groups (IG), a major responsibility of Program Leaders will be to attend IG meetings, and to monitor the progress of individual research projects in their program towards agreed milestones (research, knowledge transfer) on a regular basis through the six months between successive IG meetings. In addition, the Science Leader may occasionally call upon Program Leaders to represent aspects of the Hub to the public or to more targeted stakeholder groups. Limited Hub funds will be made available for this, if required, on a case-by-case needs analysis.

2.2.3.3. Project Leaders

Project Leaders will be responsible for sufficient, timely and effective engagement with research-users. This will be achieved by full participation in the appropriate Implementation Group(s) as well as through regular contact with their appointed Task Associate (see below). The Science Leader may occasionally call upon individual Project Leaders to represent their NERP TE Hub work to the public or to more targeted stakeholder groups. As with Program Leaders, funds will be made available for this, if required, on a case-by-case needs analysis.

2.2.3.4. Administrator

The Administrator's role is to facilitate Hub-wide engagement and knowledge transfer mechanisms. This will involve providing administrative support for Steering Committee and Implementation Group meetings, organising conferences/workshops, developing and coordinating the Hub website (including e-newsletters etc), and providing services such as knowledge brokering, synthesis and publishing as required. Administrator staff will be made available to support the Science Leader in engagement and knowledge transfer efforts as necessary. Some of these activities may be resourced from Hub-wide funds.

2.2.3.5. Specified research-users (task associates / 'buddies')

Specified individuals from research-user organisations have been identified as primary avenues of engagement and two-way knowledge transfer for each NERP TE Hub project (Appendix 1). Some research-user organisations – such as GBRMPA, TSRA and Terrain NRM – have committed fractions of FTEs of specific staff to this task. However, other research-user organisations – such as WTMA and AMPTO – have indicated they will need the support of Hub-wide resources to effectively engage and transfer knowledge. These resources may be made available on a case-by-case basis at the discretion of the Science Leader, having regard for the equity of distribution of Hub-wide resources among similar stakeholders. For example, a sum could be identified in the Budget as available to assist WTMA with transferring NERP knowledge and outcomes to Traditional Owners.

Specified research-users are responsible for adequate two-way engagement with their Research Leaders. The performance of both researcher and research-user will be monitored by the appropriate Program Leader with problems referred to the Science Leader for resolution.

2.2.3.6. Communications units in research provider and research-user organisations

Existing communications units within research provider and research-user organisations will play an important role in generating media coverage for NERP TE Hub projects under the Media Protocol (Appendix 6).

2.2.3.7. DSEWPaC

The NERP Team's TE Liaison Officer is responsible for assisting NERP TE Hub researchers, the Science Leader and Administrator staff to identify and engage with relevant officers within the Department.

In accordance with the NERP Communications Strategy, DSEWPaC is responsible for notifying the originating agency within five (5) working days if modifications are required to a proposed media release.

3. Evaluating success

Evaluating the success of research delivery in terms of influence or impact is difficult and has rarely been attempted with any rigour. However, the increasing need to demonstrate value for money for public investment in research is inevitably increasing emphasis on monitoring and evaluation. Most cases in which some evaluation has been attempted have involved the use of proxies for delivery success, such as number of reports distributed, frequency of positive media coverage, and the use of market research-type interviews, surveys or questionnaires. However, none of these methods used in isolation really answers the core question of how influential the research program has been. Occasionally, the impact of research on public policy has been scored, but this approach is complicated by the limited timeframe available (the NERP TE Hub will only run for 3.5 years) and the relatively long time periods typically required for research to influence policy or practice. As a starting point, the NERP TE Hub will focus on the transfer of information to research-users.

3.1. Approaches to monitoring and evaluating Hub influence

All activities will be consistent with the overarching NERP Program's Monitoring and Evaluation Strategy and the NERP TE Hub's Monitoring and Evaluation Plan. The intent will be to use a variety of approaches to quantifying delivery success, so that effectiveness and efficiency (and scope for Hub influence) can be improved over time.

3.1.1. Engagement

Effective engagement is critical to successful delivery and eventual influence of the Hub. Consequently, it is important that the effectiveness of the NERP TE Hub's formal engagement mechanisms be regularly assessed, problems identified and refinements made. Immediately after each meeting of each Steering Committee and Implementation Group, the Administrator will collate responses from the participants to evaluate the effectiveness and usefulness of these key forums. The feedback will be provided in a consistent form on a short proforma (with room for additional comment) to make the process efficient and the results of each survey will be considered by the Hub Management Committee. The proforma template will be endorsed by the Hub Steering Committee at its first meeting in 2012. The effectiveness of other engagement mechanisms, such as targeted workshops or annual conferences, will also be gauged with a range of proxies (e.g. number of attendees) and with exit surveys as feasible. If a particular engagement mechanism is deemed ineffective, then it will be discontinued or modified to improve its effectiveness before delivery failure occurs.

3.1.2. Delivery

In a refinement of the 'Pathways to Impact' analysis undertaken during the MTSRF, the researchers and research-users of each NERP TE Hub project will agree on the products to be delivered by each project and approximate timing. The first round of Implementation Group meetings should consider the table in Appendix 3 as the starting point for this dialogue. Each subsequent Implementation Group meeting will, among other tasks, monitor progress towards delivery of the agreed products, and Program Leaders will report on progress to the Science Leader. Demonstrated and timely

progress towards and eventual delivery of products that research-users actually need will be a powerful demonstration of the usefulness of Hub research to research-users, and will increase the Hub's opportunity for influence.

A refinement of the benchmarking survey of key research-users undertaken for the MTSRF is also recommended for the NERP TE Hub. The capacity to quantify an increase in credibility and influence of NERP TE Hub research, through comparison of results of two identical surveys undertaken three years apart, will be invaluable to building a case for Hub influence.

In addition, the Administrator will monitor a range of proxies of delivery success (e.g. website statistics, number of downloads of reports, number of subscribers to RSS feeds and e-newsletters) and will report regularly on these to the Science Leader. Media monitoring will be the responsibility of the communications units in stakeholder agencies, and they will report regularly on these to the Science Leader.

4. Budget

The budget for Science Communications and activities to support knowledge transfer is $2,797,613, which is 10.8% of the NERP funds ($25.8M) available to support the NERP TE Hub. Expenditure on the major items forecast in this Plan is as follows:

Hub Science Leader	$	359,549
Communications (Web)	$	300,000
Hub Conferences (3)	$	120,000
e-Atlas	$	1,048,064
Knowledge Broker (Analysis and Synthesis)	$	300,000
Implementation groups	$	120,000
Contestable funds for knowledge transfer	$	550,000

Appendix 1: NERP TE Hub projects and specified research-users

Project Details		Specified research-users
1.1	Monitoring status and trends of coral reefs of the GBR (Dr Hugh Sweatman, AIMS)	GBRMPA - David Wachenfeld, Laurence McCook, Fergus Molloy, Roger Beeden AMPTO - Col McKenzie DSEWPaC - Celeste Powell, Kate Sanford-Redhead, Jeff Tranter, Andrew Read DERM – John Hicks, Marine Policy rep (Jim Higgs)
1.2	Marine wildlife management in the GBRWHA (Dr Mark Hamann and Prof Helene Marsh, JCU)	GBRMPA - Mark Read, Liz Wren DSEWPaC - Jillian Grayson, Celeste Powell, Kate Sanford-Redhead, Jeff Tranter, Andrew Read DERM - Col Limpus, John Olds DEEDI - Rob Coles, Julia Davies Girringun - Phil Rist
1.3	Characterising the cumulative impacts of global, regional and local stressors on the present and past biodiversity of the GBR (Dr Jian Zhao and Prof John Pandolfi, UQ)	DSEWPaC - Dave Johnson GBRMPA - David Wachenfeld, Laurence McCook, Fergus Molloy, Roger Beeden, Leigh Bray AMPTO - Col McKenzie DERM - John Hicks, John Bennett Canegrowers - Matt Kealley DSEWPaC/DAFF Reef Rescue Team - Kevin Gale DPC – Chris Chinn
2.1	Marine Turtles and Dugong of Torres Strait (Dr Mark Hamann and Prof Helene Marsh, JCU)	TSRA - Damian Miley DSEWPaC - John McDougall, Lesley Gidding, Nathan Hanna, Margaret Considine, Bruce Edwards, Kate Sanford-Readhead, Jeff Tranter GBRMPA - Mark Read AFMA - Annabel Jones DERM - TBA DEEDI – Phil Hales

Project Details		Specified research-users
2.2	Mangrove and Freshwater Habitat Status of Torres Strait Islands (Dr Norm Duke and Dr Damien Burrows, JCU)	TSRA – Land & Sea Management Unit AFMA - Annabel Jones GBRMPA - Paul Marshall, David Wachenfeld DSEWPaC - David Johnson, Kate Sanford-Readhead, Jeff Tranter DEEDI – Phil Hales, Malcolm Pearce
2.3	Monitoring the health of Torres Strait coral reefs (Dr Ray Berkelmans, AIMS)	TSRA – Land & Sea Management Unit Tagai College - Andrew Denzin AFMA - Annabel Jones GBRMPA - Paul Marshall, David Wachenfeld DSEWPaC - David Johnson, Kate Sanford-Readhead, Jeff Tranter, Andrew Read
3.1	Rainforest Biodiversity (Prof Steve Williams JCU)	WTMA - Andrew Maclean DERM - Wolf Sievers, Andrew Millerd, Director Threatened Species FNQROC - Travis Sydes Terrain NRM - Rowena Grace, Carole Sweatman DSEWPaC – Margaret Considine, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter Australian Tropical Herbarium – Darren Crayn CAFNEC – Sarah Hoyal
3.2	Rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics and Cape York Peninsula (Prof Darren Crayn, JCU)	WTMA - Steve Goosem Terrain NRM - Rowena Grace DERM - Bruce Wannan, Director Threatened Species DSEWPaC - Tania Laity, Kate Sanford-Readhead, Jeff Tranter ABRS - Michael Preece TERN- Andy Lowe
3.3	Targeted surveys for missing and critically endangered rainforest frogs in ecotonal areas, and assessment of whether populations are recovering from disease (Dr Robert Puschendorf & Dr Conrad Hoskin JCU)	DERM - Andrew Millerd; Wolf Sievers, Keith McDonald, Rebecca Williams Terrain NRM - Rowena Grace WTMA - Steve Goosem DSEWPaC - Julian Barnard, Damian McRae, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter, Lesley Gidding

Project Details		Specified research-users
3.4	Monitoring of Key Vertebrate Species (Dr David Westcott, CSIRO)	DSEWPaC - Tim McGrath, Ben Maly, Peter Latch, David Jackson, Kate Sanford-Readhead, Jeff Tranter, Celeste Powell, Margaret Considine, Damian McRae, Kynan Gowland DERM - Michael Devery, Andrew Millerd, Director Threatened Species FNQROC - Travis Sydes Terrain NRM - Carole Sweatman Cairns Regional Council - Russell Wild
4.1	Tracking coastal turbidity over time and demonstrating the effects of river discharge events on regional turbidity (Dr Katharina Fabricius, AIMS)	DSEWPAC - Vaughn Cox, Celeste Powell Reef Rescue - Kevin Gale GBRMPA - Hugh Yorkston, Katherine Martin DERM - John Bennett Reef Plan Secretariat - Chris Chinn DEEDI - Adam West Terrain NRM - Fiona Barron Burdekin Dry Tropics NRM - Diana O'Donnell Mackay Whitsundays NRM – Will Higham Fitzroy Basin Association - Suzie Christensen, Nathan Johnson Burnett Mary Regional Group - Fred Bennett MLA - Mick Quirk WWF - Nick Heath, Juliette King

Project Details		Specified research-users
4.2	The chronic effects of pesticides and their persistence in tropical waters (Dr Andrew Negri, AIMS)	GBRMPA - Hugh Yorkston, David Wachenfeld DERM - Michael Warne Reef Rescue - Kevin Gale Reef Plan Secretariat – Chris Chinn Terrain NRM - Fiona Barron Burdekin Dry Tropics NRM - Diana O'Donnell Mackay Whitsundays NRM – Will Higham Fitzroy Basin Association - Suzie Christensen, Nathan Johnston Burnett Mary Regional Group - Fred Bennett Canegrowers - Matt Kealley DSEWPAC - Jack Holland, Katherine Martin, Leigh Gray WWF - Nick Heath, Juliette King
4.3	Ecological risk assessment for water quality of the GBR (Jon Brodie, JCU)	GBRMPA - David Wachenfeld, Hugh Yorkston Canegrowers - Matt Kealley DERM - John Bennett DEEDI –Adam West Reef Plan Secretariat - Claire Andersen Reef Rescue - Kevin Gale Terrain NRM - David Maclean NQ Dry Tropics – Diana O'Donnell Reef Catchments NRM – Will Higham Fitzroy Basin Association - Nathan Johnston DSEWPaC – Celeste Powell
4.4	Hazard assessment for water quality threats to Torres Strait marine waters, ecosystems and public health (Jon Brodie, JCU)	TSRA – Land & Sea Management Unit Tagai College - Andrew Denzin Torres Strait Community - John Morris AFMA - Annabel Jones DSEWPaC - Celeste Powell TSIRC - Patrick McGuire

Project Details		Specified research-users
5.1	Understanding GBR diversity: spatial and temporal dynamics and environmental drivers (Dr Glenn De'ath, AIMS)	GBRMPA - David Wachenfeld, Fergus Molloy, Laurence McCook, Roger Beeden DERM – Jim Higgs DEEDI - Rob Coles Malcolm Dunning DSEWPAC - Celeste Powell, Kate Sanford-Readhead, Jeff Tranter AMPTO - Colin McKenzie
5.2	Combined water quality-climate effects on coral and other reef organisms (Dr Sven Uthicke, AIMS)	GBRMPA - Paul Marshall, Hugh Yorkston, Katherine Martin Reef Rescue - Kevin Gale DERM - John Bennett Reef Plan Secretariat – Grahame Byron Canegrowers - Matt Kealley MLA - Mick Quirk WWF - Nick Heath, Juliette King DSEWPaC – Celeste Powell
5.3	Vulnerability of seagrass habitats in the GBR to changing coastal environments (Dr Catherine Collier, JCU)	DEEDI - Phil Hales, John Beumer GBRMPA - Katherine Martin DERM - Michael Holmes, John Olds Reef Rescue - Kevin Gale Reef Plan Secretariat - Chris Chinn DSEWPaC – Celeste Powell, Lesley Gidding, Kate Sanford-Readhead, Jeff Tranter
6.1	Maximising the benefits of mobile predators to GBR ecosystems: the importance of movement, habitat and environment (Dr Michelle Heupel, AIMS)	DSEWPaC - Nathan Hanna, Kate Sanford-Readhead, Jeff Tranter GBRMPA - Mark Read, Randall Owens DERM – Richard Quincey DEEDI - Bonnie Holmes QSIA - Winston Harris CapReef - Bill Sawynok

Project Details		Specified research-users
6.2	Drivers of juvenile shark biodiversity and abundance in inshore ecosystems of the GBR (Dr Colin Simpfendorfer, JCU)	GBRMPA - Randall Owens, Mark Read, Rachel Pears DERM – Richard Quincey DEEDI - Malcolm Dunning, Julia Davies QSIA - Winston Harris DSEWPaC – Lesley Gidding, Nathan Hanna, Kate Sanford-Readhead, Jeff Tranter
6.3	Critical seabird foraging locations and trophic relationships for the GBR (Dr Brad Congdon, JCU)	GBRMPA – Malcolm Turner, Paul Marshall, Roger Beeden BOM/CSIRO/NARP -Lynda Chambers AFMA - Steve Auld DERM – Andrew McDougall DEEDI - Malcolm Dunning DSEWPaC – Celeste Powell, Kate Sanford-Readhead, Jeff Tranter, Lesley Gidding
7.1	Fire & rainforests (Dr Dan Metcalfe, CSIRO)	DERM - Andrew Millerd, Rebecca Williams WTMA - Steve Goosem Terrain NRM - Rowena Grace Cassowary Coast Regional Council - Damon Sydes DSEWPaC - Kate Sanford-Readhead, Jeff Tranter
7.2	Invasive species risks and responses in the Wet Tropics (Dr Helen Murphy, CSIRO)	DERM - Andrew Millerd WTMA - Steve Goosem Terrain NRM - Rowena Grace; Cassowary Coast Regional Council - Damon Sydes DSEWPaC – Damian McRae, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter
7.3	Climate change and the impacts of extreme events on Australia's Wet Tropics biodiversity (Dr Justin Welbergen, ANU)	WTMA - Steve Goosem, Andrew Maclean DERM - Wolf Sievers, Andrew Millerd Terrain NRM - Rowena Grace, Carol Sweatman DSEWPaC – Celeste Powell

Project Details		Specified research-users
8.1	Monitoring the ecological effects of GBR zoning plan on mid and outer shelf reefs (Dr Hugh Sweatman, AIMS)	GBRMPA -David Wachenfeld, Laurence McCook AMPTO - Col McKenzie DERM – Jim Higgs, John Hicks DEEDI - Malcolm Dunning DSEWPaC - Kate Sanford-Readhead, Jeff Tranter
8.2	Assessing the long-term effects of management zoning on inshore reef of the GBR (Prof Garry Russ, JCU)	GBRMPA - Laurence McCook, David Wachenfeld, Fergus Molloy CapReef - Bill Sawynock DERM – Jim Higgs, John Hicks DEEDI - Brigid Kerrigan WA DEC - Chris Simpson
8.3	Significance of no-take marine protected areas to regional recruitment and population persistence on the GBR (Prof Geoff Jones, JCU)	GBRMPA - Laurence McCook, David Wachenfeld, Fergus Molloy CapReef - Bill Sawynock DERM – Jim Higgs, John Hicks DEEDI - Brigid Kerrigan WA DEC - Chris Simpson
9.1	Dynamic Vulnerability Maps and Decision Support Tools for the Great Barrier Reef (Dr Ken Anthony, AIMS)	GBRMPA - Roger Beeden, Paul Marshall, David Wachenfeld DERM – John Olds DEEDI - Brigid Kerrigan DSEWPaC - Kate Sanford-Readhead, Jeff Tranter
9.2	Design and implementation of management strategy evaluation for the GBR (Dr Cathy Dichmont, CSIRO)	GBRMPA - Laurence McCook, Mark Read DEEDI - Mark Lightowler DERM – Jim Higgs, Michael Warne, John Bennett, Richard Quincey DSEWPaC - Kate Sanford-Readhead, Jeff Tranter
9.3	Prioritising management actions for GBR islands (Prof Bob Pressey, JCU)	DERM - John Hicks, Rebecca Williams GBRMPA - Malcolm Turner AMPTO - Colin McKenzie DSEWPaC – Celeste Powell

Project Details		Specified research-users
9.4	Spatial planning for coastal development in the GBR region (Prof Bob Pressey, JCU)	DERM - John Lane, James Murphy, John Bennett, Fiona Leverington DLGP - TBA Reef Plan Secretariat – Claire Andersen GBRMPA - Hugh Yorkston AMPTO - Colin McKenzie Reef Rescue - Kevin Gale DEEDI - Adam West, Malcolm Dunning Terrain NRM - Fiona Barron NQ Dry Tropics NRM - Ian Dight Reef Catchments NRM - Carl Mitchell Fitzroy Basin Association - Nathan Johnson Burnett Mary Regional Group - Fred Bennett WWF -Nick Heath QSIA -Winston Harris DSEWPaC - Kate Sanford-Readhead, Jeff Tranter
10.1	Social and economic long-term monitoring program (SELTMP) (Dr Nadine Marshall, CSIRO)	GBRMPA - Dave Wachenfeld, Margaret Gooch, Peter McGinnity QSIA - Winston Harris AMPTO - Col McKenzie FRDC - Crispian Ashby DERM – Gay Crowley, Jim Higgs, John Hicks, Andrew Grodecki DEEDI - Kirrily McInnes, Michelle Winning Tourism Queensland - Dave Morgans

Project Details		Specified research-users
10.2	Socio-economic system and reef resilience (Dr Natalie Stoeckl, JCU)	GBRMPA - Margaret Gooch DERM - Doug Yuille, Gaye Crawley TTNQ - Rob Giason DERM – Gay Crowley, Jim Higgs, John Hicks, Andrew Grodecki DEEDI - Adam West, Kirrily McInnes, Michelle Winning, Lew Williams QSIA - Winston Harris Sunfish - Barry Pollock Alliance for Sustainable Tourism - John Courtenay AMPTO - Col McKenzie
11.1	Building resilient communities for Torres Strait futures (Dr James Butler, CSIRO)	TSRA - John Rainbird AFMA - Annabel Jones QLD Govt – John O'Halloran DEWPaC International Section - John McDougall, Bruce Edwards DFAT - Simon Moore DEEDI – Malcolm Pearce
11.2	Improved approaches for the detection and prevention of wildlife diseases in the Torres Strait. (Dr Sue Laurence, JCU)	Biosecurity Queensland AQIS TSRA Biosecurity Team DEEDI – Shane Ross (TBC) DSEWPaC – Damian McRae

Project Details		Specified research-users
12.1	Indigenous peoples and protected areas (Dr Ro Hill, CSIRO)	Girringun Aboriginal Corp - Phil Rist WTMA - Andrew Maclean JabalbinaYalanji Aboriginal Corporation - Paul Barrett DERM – Wolf Sievers, Ross McLeod, Lyn Wallace, Jim Higgs, Bruce Rampton CWTICCAC - Joann Schmider DSEWPaC - Bruce Rose, Marcus Sandford, John Hunter MandingalbayYidinji - Dale Mundraby Terrain NRM - Carole Sweatman, Steve McDermott CYPRSCAC - Nigel Stork
12.2	Harnessing natural regeneration for cost-effective rainforest restoration (Prof Carla Catterall Griffith/ Dr Luke Shoo UQ)	WTMA - Steve Goosem, Deborah Pople, Bruce Jennison; Max Chappell Terrain NRM - Carole Sweatman, Steve McDermott, Rowena Grace, Penny Scott DERM - Keith Smith, Don Butler, Peter Scarth FNQROC - Travis Sydes CVA - Dave Hudson DSEWPaC – Celeste Powell
12.3	Relative social and economic values of residents and tourists in the WTWHA (Dr Natalie Stoeckl, JCU)	WTMA - Andew Maclean Terrain NRM - Rowena Grace DERM – Wolf Sievers, Bruce Rampton Alliance for Sustainable Tourism - John Courtenay
12.4	Governance, planning and the effective application of emerging ecosystem service markets: climate change adaptation and landscape resilience (Dr Allan Dale, JCU)	Terrain NRM - Carole Sweatman CYPNRM - Bob Frazer QRCC - Mike Berwick WTMA - Andrew Maclean DIP - Robyn Clark FNQROC - Darlene Irvine RDA FNQ&TS - Rene Nusse

Project Details		Specified research-users
13.1	e-Atlas (GBR) (Dr Eric Lawrey, AIMS)	GBRMPA - Cherie Malone, Fergus Molloy DEEDI - Malcolm Dunning, Ian Jacobsen (Torres Strait e-Atlas) WTMA - Michael Stott Reef Plan Secretariat - Chris Chinn Reef Rescue - Kevin Gale DERM - John Bennett, Lindsay Redlich Terrain NRM - Fiona Barron NQ Dry Tropics – Diana O'Donnell Reef Catchments NRM - Carl Mitchell Fitzroy Basin Association - Nathan Johnston TSRA - Tony O'Keefe, Vic McGrath John Rainbird, Damien Miley Torres Strait Community - John Morris AFMA - Annabelle Jones DSEWPAC - David Johnson, Kate Sanford-Readhead, Jeff Tranter DEEDI - Ian Jacobsen, Anne Clarke Tagai College - Andrew Denzin

Appendix 2: Summary of NERP TE Hub stakeholder consultations

Analysis of the results of consultations conducted with a wide range of NERP TE Hub stakeholders (specifically GBRMPA, WTMA, TSRA, DSEWPaC, DPC, DEEDI, Terrain, AMPTO, WWF, Infofish, AIMS, JCU and CSIRO) shows that, while there are a number of areas of general agreement, there are also a number of areas where the range of stakeholder views is very diverse.

Major areas of consensus

- A diversity of approaches to engagement, knowledge brokering and communications will be required. The NERP TE Hub Science Communication Plan will need to reflect this diversity in its structure and resourcing.
- There are many existing frameworks and mechanisms for engagement, knowledge brokering and communications within the region and stakeholders. NERP TE Hub should not seek to duplicate these arrangements, but exploit them.
- There is a need to improve upon previous mechanisms for engagement such that research-users can actually guide research directions. Both researchers and research-users will need to be accountable for their participation in this engagement mechanism.
- Media should be handled by research provider agencies (about the research results) and management agencies (about the implications of the research for management) under protocols agreed by all involved institutions, and in accordance with protocols stipulated by SEWPaC. Strong support for 'no surprises' approach to media.
- There is a need for a Hub website that represents the Hub publicly and is a source of information about Hub-funded research and activities.
- There seems to be general support for more targeted meetings/workshops on topics of relevance to research-users, rather than one Hub-wide annual conference per year.

Major areas requiring discussion

- The preferred mode of formalised engagement for the NERP TE Hub would seem to involve relatively small meeting groups focused on topics of interest to stakeholders (e.g. climate change impacts on the GBR) in which research-users have genuine opportunity to direct research. The number of these groups, their composition and the frequency of their meetings will need to be decided. Some Hub resources would have to be devoted to coordination/administration of this primary engagement mechanism, including periodic assessment of whether the groups are achieving their objectives. These meeting groups are an attempt to facilitate engagement on behalf of those stakeholders who require assistance, and should not prevent any stakeholder from engaging directly with researchers of interest, should they wish to do so.
- Successful delivery of information to all research-users is fundamental if the Hub is to achieve its objective of maximising the potential for influence. However, it is clear that one model will not fit all for the NERP TE Hub. Some stakeholders would prefer to interact directly with researchers, while some have indicated that they will not be able to make effective use of Hub-generated information without some form of knowledge-brokering assistance. How can this diversity of needs and capacities be most appropriately serviced, given the limited resources available for knowledge brokering and communications within the NERP TE Hub? If there is a need for Hub-

wide knowledge brokering capacity, whose job should it be to provide this support, and how should it be resourced?

- If Program Leaders or individual researchers are to bear some or all responsibility for knowledge brokering and communications, how should this be organised, reported upon and resourced?
- The website and e-Atlas are important mechanisms for delivery to all stakeholders and their resource allocations should reflect this.

Appendix 3: Summary of expected knowledge brokering/communications products, delivery mechanisms and key audiences, by project

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
THEME 1							
Program 1 – Historical and current condition of the Great Barrier Reef (Program Leader Prof John Pandolfi)							
1.1	Monitoring status and trends of coral reefs of the GBR (Dr Hugh Sweatman, AIMS)	• Survey results 2012-2013 delivered in a form that they easily feed into 2014 Outlook Report (late 2013) • Provision of "situational awareness" for GBRMPA (ongoing) • Updated COTS survey results in a form accessible to AMPTO and GBRMPA (ongoing)	• e-Atlas report including maps and GIS layers developed in concert with GBRMPA task associates (researcher, e-Atlas) • Six-monthly project milestone reports provided to GBRMPA task associates (RRRC) • COTS e-Atlas report including maps and GIS layers delivered to AMPTO and GBRMPA (researcher, e-Atlas) • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)	GBRMPA - David Wachenfeld, Laurence McCook, Fergus Molloy, Roger Beeden AMPTO - Col McKenzie SEWPaC - Celeste Powell, Kate Sanford-Redhead, Jeff Tranter, Andrew Read Qld DERM	• 2012/2013 survey results used in GBRMPA's 2014 Outlook Report • Use of COTS survey results in actions to mitigate the impact of COTS • Number of briefings provided by project leader to research users	• Dependent on effective engagement GBRMPA • Dependent on effective engagement with AMPTO	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
1.2	Marine wildlife management in the GBRWHA (Dr Mark Hamann and Prof Helene Marsh, JCU)	• Map of likely coastal dolphin habitat and surveyed numbers in the northern GBRWHA (late 2013) • Improved and updated information on status of dugong populations within the GBRWHA (late 2013) • Increased understanding of impact of protected areas, TUMRAs and extreme weather events on marine species of conservation concern (end project)	• e-Atlas report including map and GIS layer for GBRMPA's 2014 Outlook Report (e-Atlas, researchers, GBRMPA task associate) • e-Atlas report including updated dugong density maps and GIS layer for GBRMPA's 2014 Outlook Report (e-Atlas, researchers, GBRMPA task associate) • Plain-English final report designed to inform 2014 Outlook Report (researchers, GBRMPA task associate) • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	GBRMPA - Mark Read, Liz Wren SEWPaC - Jillian Grayson, Celeste Powell, Kate Sanford-Redhead, Jeff Tranter, Andrew ReadDERM - Col Limpus DEEDI - Rob Coles, Julia Davies Girringun - Phil Rist	• New coastal dolphin information included in 2014 Outlook Report • Updated dugong population status information included in 2014 Outlook Report • Participation by TOs in fieldwork • Number of briefings provided by project leader to research users	• Highly dependent on effective engagement GBRMPA	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
1.3	Characterising the cumulative impacts of global, regional and local stressors on the present and past biodiversity of the GBR (Dr Jian Zhao and Prof John Pandolfi, UQ)	• Long-term palaeoecological records of coral reef community structure along the length of the GBR • High-resolution chronological records of various climatic stressors such as sea-level, sea-surface temperature, salinity, alkalinity, cyclone frequency and ENSO variability over the past 1-2 millennia, enabling prediction of future response to these stressors over regional scales • Comparative geochemical proxy records of site-specific seawater quality variation prior to and since European settlement • Long-term trends in coral calcification in response to multiple stressors including climate and water quality changes over the past hundreds to thousands of years. • Chronological records of coral reef mortality events and rates on regional scales and their correlation with global, regional and local stressors	• Regular informal updates through direct involvement of GBRMPA staff in the project • Plain-English final report designed to inform 2014 Outlook Report (researchers, GBRMPA task associate) • Six-monthly project milestone reports provided to GBRMPA task associates (RRRC) • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (UQ) • Presentation at annual NERP TE Hub conference (researchers)	DSEWPaC - Dave Johnson GBRMPA - David Wachenfeld, Laurence McCook, Fergus Molloy, Roger Beeden, Leigh Bray AMPTO - Col McKenzie DERM - John Mullins, John Bennett Canegrowers - Matt Kealley SEWPaC/DAFF Reef Rescue Team - Kevin Gale DPC – Chris Chinn	• Incorporation of palaeoecological information in 2014 Outlook report, including high-resolution chronological records of various climatic stressors, site-specific seawater quality variation prior to and since European settlement, long-term trends in coral calcification and records of coral reef mortality events • Number of briefings provided by project leader to research users	• Dependent on effective engagement with GBRMPA	o Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
Program 2 – Natural Resources of the Torres Strait land and sea – (Program Leader Prof Helene Marsh)							
2.1	Marine Turtles and Dugong of Torres Strait (Dr Mark Hamann and Prof Helene Marsh, JCU)	• Improved understanding of the status of marine turtles in Torres Strait • Detailed understanding of turtle and dugong spatial ecology, plus the threats to these populations • Estimates of dugong population abundance in Torres Strait, particularly within western Torres Strait and dugong protected areas and community-based management areas • Improved stakeholder understanding, capacity and skills to better monitor and manage priority species • Improved non-Indigenous participants knowledge of traditional ecological knowledge and cultural aspects of turtle and dugong management	• Reports describing: - The status of the green turtle in Torres Strait - The status of the hawksbill and flatback turtles in Torres Strait - The ecological and biological connectivity and habitat use of dugongs and marine turtles in relation to protected areas and community based management areas • Regular informal updates through direct involvement of TSRA LSMU staff in the project • e-Atlas report including updated dugong density maps and GIS layer for Torres Strait • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Close liaison with and involvement of Torres Strait communities • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers), particularly the TSRA Land and Sea Management Unit	TSRA - Damian Miley DSEWPaC - Jillian Grayson, Lesley Gidding, Nathan Hanna, Margaret Considine, Bruce Edwards, Kate Sanford-Readhead, Jeff Tranter GBRMPA - Mark Read AFMA - Annabel Jones DERM - Col Limpus DEEDI – Ian Jacobsen	• Improved understanding of the status of marine turtles and dugongs in Torres Strait • Incorporation of estimates of dugong population abundance in dugong management plans • Improved non-Indigenous participants knowledge of traditional ecological knowledge and cultural aspects of turtle and dugong management • Improved stakeholder understanding, capacity and skills to better monitor and manage priority species	• Dependent on effective engagement with the TSRA's LSMU and Ranger team • Dependent on effective engagement with TSIRC	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas.

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
2.2	Mangrove and Freshwater Habitat Status of Torres Strait Islands (Dr Norm Duke and Dr Damien Burrows, JCU)	• Baseline surveys of mangrove and freshwater habitats, including the presence of exotic fishes and aquatic plants, on populated islands of the Torres Strait • Improved knowledge of local community use of mangrove and freshwater habitats • Mitigation options for mangroves, protection/management /rehabilitation needs, and climate change-related adaptive strategies	• Reports describing the status of mangrove and freshwater habitats in Torres Strait • A renewable and expanding archive of geo-referenced maps and imagery • e-Atlas maps of the full extent of coastal vegetation units and how these units have changed over time • Community dialogue on values and management of mangroves and freshwaters, with particular involvement of land and sea rangers • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	TSRA – Land & Sea Management Unit Tagai College - Andrew Denzin AFMA - Annabel Jones GBRMPA - Paul Marshall, David Wachenfeld DSEWPaC - David Johnson, Kate Sanford-Readhead, Jeff Tranter DEEDI – Phil Hales, Anne Clarke	• Incorporation of results of baseline surveys of mangrove and freshwater habitats into management plans • Adoption of mitigation options for mangroves, protection/management/rehabilitation • Improved knowledge of local community values and use of mangrove and freshwater habitats	• Dependent on effective engagement with the TSRA's LSMU and Ranger Team • Dependent on effective engagement with TSIRC	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
2.3	Monitoring the health of Torres Strait coral reefs (Dr Ray Berkelmans, AIMS)	• Detailed assessment of biodiversity on coral reefs in the Torres Strait • Review of existing data on Torres Strait reefs • Estimated interim bleaching thresholds for the Torres Strait • Early warning system for coral bleaching based on real-time monitoring of sea temperature; • Design and implementation of a long-term monitoring program to be delivered by Indigenous sea rangers • Data management system for data capture and delivery of appropriate and useful data products using the e-atlas.	• Reports on the biodiversity of coral reefs in Torres Strait • Regular updates on current atmospheric and oceanographic conditions and summer forecasts for bleaching risk • e-atlas (data layers for mapping, plain English article(s), metadata); and establishment of a network of data kiosks in strategic locations throughout Torres Strait • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Regular informal updates through direct involvement of TSRA LSMU staff in the project • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS/UQ) • Presentation at annual NERP TE Hub conference (researchers)	TSRA – Land & Sea Management Unit Tagai College - Andrew Denzin AFMA - Annabel Jones GBRMPA - Paul Marshall, David Wachenfeld DSEWPaC - David Johnson, Kate Sanford-Readhead, Jeff Tranter, Andrew Read	• Established monitoring program for reefs of Torres Strait • Established early warning system for coral bleaching in Torres Strait • Established data management system to capture existing and future data on Torres Strait reefs • Field monitoring team of up to 6 LSMU rangers trained to implement and run an effective reef monitoring program • Successful transfer of knowledge and technology to LMSU Rangers to exchange temperature loggers, perform diagnostics and	• Dependent on effective engagement with the TSRA's LSMU and Ranger Team • Dependent on effective engagement with TSIRC • Dependent on infrastructure and logistic support contributed by TSRA and collaborators	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
					maintenance of real-time monitoring stations and provide field verification of bleaching.		
Program 3 – Condition and trends of north Queensland rainforests – Williams							
3.1	Rainforest Biodiversity (Prof Steve Williams JCU)	• Maps of past, current and predicted future patterns in biodiversity and the environment; • Conservation priorities for rainforest flora and fauna • Understanding of the threats, vulnerability and adaptive capacity of rainforest biodiversity to global climate change • Understanding of the relative importance of landscape structural features that promote ecosystem resilience such as refugia, habitat connectivity and heterogeneity, seasonal and long term environmental stability, and key ecosystem processes	• Detailed mapping of past, current and future status and trends in biodiversity and the environment delivered through the e-Atlas • Report assessing the relative vulnerability of the regions biodiversity to global climate change • Report prioritising the conservation status of most rainforest vertebrates, significant invertebrate groups, vegetation classes and ecosystem processes • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate	WTMA - Andrew Maclean DERM - Wolf Sievers, Andrew Millerd FNQROC - Travis Sydes Terrain NRM - Rowena Grace, Carole Sweatman DSEWPaC – Margaret Considine, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter Australian Tropical Herbarium – Darren Crayn	• Adoption of conservation priorities for rainforest flora and fauna • Improved understanding of the threats, vulnerability and adaptive capacity of rainforest biodiversity to global climate change • Improved understanding of the relative importance of landscape structural features that promote ecosystem resilience such as refugia, habitat	• Dependent on effective engagement with WTMA	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			(JCU) • Presentation at annual NERP TE Hub conference (researchers)		connectivity and heterogeneity, seasonal and long term environmental stability, and key ecosystem processes		
3.2	Rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics and Cape York Peninsula (Prof Darren Crayn, JCU)	• Assessment of genetic diversity of mountain-top floras and/or other postulated refugia to enable effective prioritization of limited resources for species conservation • Identification of hotspots of phylogenetic diversity in NE Queensland rainforest floras • Systematic survey of mountain-top fungal flora	• Reports describing hotspots of phylogenetic diversity in NE Queensland rainforest floras • Report incorporating genetic data to update the assessment of conservation priorities for the Wet Tropics Bioregion • e-Atlas maps of taxonomic richness and phylogenetic diversity across the NE Queensland rainforest • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE	WTMA - Steve Goosem Terrain NRM - Rowena Grace DERM - Bruce Wannan DSEWPaC - Tania Laity, Kate Sanford-Readhead, Jeff Tranter ABRS - Michael Preece TERN- Andy Lowe	• Incorporation of genetic data in updating the assessment of conservation priorities for the Wet Tropics Bioregion • Improved knowledge of patterns of taxonomic richness and phylogenetic diversity across the NE Queensland rainforest	• Dependent on effective engagement with WTMA	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			Hub conference (researchers)				
3.3	Targeted surveys for missing and critically endangered rainforest frogs in ecotonal areas, and assessment of whether populations are recovering from disease (Dr Robert Puschendorf & Dr Conrad Hoskin JCU)	• Surveys of dry forest ecotonal sites and adjacent rainforest sites for missing and endangered frogs and vertebrate species of the Wet Tropics and Eungella • Estimates of the distribution and prevalence of chytrid fungus across populations and different environments • Identification of critical ecotonal areas that act as disease refugia for critically endangered rainforest frogs, or areas of importance for other vertebrate species	• Reports describing: - the status of endangered frogs and data on other vertebrate species of the Wet Tropics and Eungella - the distribution and prevalence of chytrid fungus across populations and different environments - critical ecotonal areas that act as disease refugia for critically endangered rainforest frogs, or areas of importance for other vertebrate species • e-Atlas maps illustrating: - the distribution and abundance of endangered frogs and select other vertebrate species of the Wet Tropics and Eungella - the distribution and prevalence of chytrid fungus across populations and different environments • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as	DERM - Andrew Millerd; Wolf Sievers Terrain NRM - Rowena Grace WTMA - Steve Goosem DSEWPaC - Julian Barnard, Damian McRae, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter, Lesley Gidding	• Improved knowledge of the population status of missing and endangered frogs and vertebrate species of the Wet Tropics and Eungella • Improved knowledge of the distribution and prevalence of chytrid fungus • Adoption of recommendations identifying critical ecotonal areas that act as disease refugia for critically endangered rainforest frogs, or areas of importance for other vertebrate species		• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
3.4	Monitoring of Key Vertebrate Species (Dr David Westcott, CSIRO)	• Estimates of distribution, abundance and population structure of Cassowaries and Spectacled Flying Fox populations across the Wet Tropics Region • A standardised method for long-term cassowary monitoring and estimation of cassowary population sizes at regional, local, and tenure scales • Long-term database on spectacled flying-fox population trends at local and regional scales	• Reports describing: - Cassowary population size, distribution and structure across the Wet Tropics Region and sub-regions - Patterns of relatedness between cassowary populations in sub-regions - Key sub-regions and local areas for cassowary conservation and for conservation planning based on population size, distribution, patterns of relatedness, avenues of connectivity and habitat value. - the size and distribution of spectacled flying-fox populations across the year and the long-term trends in these dynamics at local and regional scales • e-Atlas maps illustrating: - Cassowary population size and distribution across the Wet Tropics Region and sub-regions - key sub-regions and local areas for cassowary conservation and for conservation planning - the size and distribution of	DSEWPaC - Tim McGrath, Ben Maly, Peter Latch, David Jackson, Kate Sanford-Readhead, Jeff Tranter, Celeste Powell, Margaret Considine, Damian McRae, Kynan Gowland QPWS - Scott Sullivan, Andrew Millerd DERM - Michael Devery FNQROC - Travis Sydes Terrain NRM - Carole Sweatman Cairns Regional Council - Russell Wild	• Established database of long term trends in Spectacled Flying Fox populations • Adoption of the standardised method for cassowary monitoring in fauna surveys • The incorporation of identified key sub-regions and local areas in cassowary conservation and planning • Improved knowledge of Cassowary population size, distribution and structure across the Wet Tropics Region and sub-	• Dependent on effective collaboration with government departments in relation to cassowary conservation planning.	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			spectacled flying-fox populations • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)		regions • Improved knowledge of the size, distribution and dynamics of spectacled flying-fox populations		
THEME 2							
Program 4 – Water quality of the Great Barrier Reef and Torres Strait – Schaffelke							
4.1	Tracking coastal turbidity over time and demonstrating the effects of river discharge events on regional turbidity (Dr Katharina Fabricius, AIMS)	• Region-specific quantitative relationships between river discharges, weather, and water clarity for each NRM region of the GBR • A better scientific information basis for Reef Rescue and Reef Plan and refinement of targets • Region-specific quantitative relationships between terrestrial runoff, water	• Reports providing an explicit link between terrestrial runoff and the intra- and inter-annual variation in water clarity on the inshore GBR for each NRM Region • e-Atlas maps of water clarity • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as	DSEWPAC - Vaughn Cox, Celeste Powell Reef Rescue - Kevin Gale GBRMPA - Hugh Yorkston, Katherine Martin DERM - John Bennett Reef Plan Secretariat - Chris Chinn DEEDI - Adam West Terrain NRM - Fiona Barron	• Improved knowledge of the explicit link between terrestrial runoff and the intra- and inter-annual variation in water clarity on the inshore GBR for each NRM Region • Adoption of outcomes in Reef Rescue and Reef Plan	• Dependent on effective engagement with SEWPaC' s Reef Rescue team • Dependent on effective engagement with Reef Rescue Marine Monitoring Program (GBRMPA)	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		clarity and environmental drivers that will allow validation and calibration of the Receiving Waters Model and the WQ Risk Analysis	requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)	Burdekin Dry Tropics NRM - Ian Dight, Diana O'Donnell Mackay Whitsundays NRM - Derek Ball, Carl Mitchell Fitzroy Basin Association - Suzie Christensen, Nathan Johnson Burnett Mary Regional Group - Fred Bennett MLA - Mick Quirk WWF - Nick Heath, Juliette King	refinement of targets • Use of outcomes to validate and calibrate the Receiving Waters Model and the WQ Risk Analysis • Incorporation of new knowledge on relationships between river discharges, weather, and water clarity into 2014 Outlook report	• Dependent on effective engagement with Reef Plan Paddock to Reef Program (Department of Premier and Cabinet)	
4.2	The chronic effects of pesticides and their persistence in tropical waters (Dr Andrew Negri, AIMS)	• Quantification of the chronic effects and toxic thresholds of herbicides detected in the GBR on seagrass and corals under current and future climate scenarios • Understanding of the persistence of herbicides under conditions relevant to tropical coastal and inshore waters and test the toxicity of their breakdown products • Understanding of pesticide transport	• Reports describing: - effects of herbicides and increased sea surface temperature, light stress/limitation and reduced salinity on seagrasses and corals - threshold toxicity of herbicides on inshore biota - the efficacy of managing low-level, chronic herbicide exposures for seagrass protection - the influence of chronic herbicide exposures on critical coral reef processes such as coral recruitment and if managing	GBRMPA - Hugh Yorkston, David Wachenfeld DERM - Michael Warne Reef Rescue - Kevin Gale Reef Plan Secretariat – Chris Chinn Terrain NRM - Fiona Barron Burdekin Dry Tropics NRM - Ian Dight, Diana O'Donnell Mackay	• Improved understanding of the chronic effects and toxic thresholds of herbicides in the GBR on seagrass and corals under current and future climate scenarios • Improved understanding of the persistence of herbicides in	• Dependent on direct collaboration with Reef Rescue projects 37 and 38. • Dependent on effective engagement with SEWPaC' s Reef Rescue team • Dependent on effective engagement	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		mechanisms and how this affects toxicity	pesticide input into the GBR can improve recruitment under likely future climate conditions - The half lives of herbicides (including diuron, atrazine, hexazinone and tebuthiuron) at multiple temperatures relevant to those in flood plumes - The toxicity of herbicide breakdown products • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)	Whitsundays NRM - Derek Ball, Carl Mitchell Fitzroy Basin Association - Suzie Christensen, Nathan Johnson Burnett Mary Regional Group - Fred Bennett Canegrowers - Matt Kealley DSEWPAC - Jack Holland, Katherine Martin, Leigh Gray WWF - Nick Heath, Juliette King	tropical waters • Improved understanding of pesticide transport mechanisms and how this influences toxicity • Adoption of refined pesticide thresholds in refining water quality indicators and managing runoff and the health of inshore biota • Incorporation of new knowledge on chronic effects of pesticides and their persistence in tropical waters into 2014 Outlook report	with Reef Rescue Marine Monitoring Program (GBRMPA)	
4.3	Ecological risk assessment for water quality of the GBR (Jon Brodie, JCU)	• Scoping of the development of a systematic, objective and transparent risk-based approach to quantify the	• Review the methodology available for a risk assessment of pesticides, nutrients and sediment to the ecosystems of the GBR and recommendations	GBRMPA - David Wachenfeld, Hugh Yorkston Canegrowers - Matt	• Funding and implementation of recommended approach to risk	• Dependent on key research users' input via	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		relative risk of pesticides, nutrients and sediment to the ecosystems of the GBR (to be funded by other programs) • A 'meta database' of the existing data and information needed to conduct the risk assessment	on the most suitable method considering the objectives of the risk assessment and the data available • A report of the meta database of data and information (including spatial data) available to use in the risk assessment • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	Kealley DERM - John Bennett DEEDI –Adam West Reef Plan Secretariat - Chris Chinn, Claire Andersen Reef Rescue - Kevin Gale Terrain NRM - David Maclean NQ Dry Tropics - Ian Dight Reef Catchments NRM - Carl Mitchell Fitzroy Basin Association - Nathan Johnston DSEWPaC – Celeste Powell	assessment of pesticides, nutrients and sediment to the ecosystems of the GBR • Adoption of outcomes of subsequent risk assessment to guide future investment in new programs such as Reef Rescue 2013 and Reef Plan 2013	workshops.	• Workshop facilitation and assistance may be required.
4.4	Hazard assessment for water quality threats to Torres Strait marine waters, ecosystems and public health (Jon Brodie, JCU)	• Desktop hazard assessment of current sources of pollution to marine ecosystems and public health • A basic monitoring program that would allow reporting on the status of water quality in the Torres Strait and assessments of the success of pollution	• Report assessing all existing and potential sources of pollution to the Torres Strait marine environment • e-Atlas georeferenced data sets on the spatial location of current and proposed pollutant sources relevant to the Torres Strait along with text descriptions and statistics of the sources • e-Atlas metadata record to ensure broad discoverability of	TSRA – Land & Sea Management Unit Tagai College - Andrew Denzin Torres Strait Community - John Morris AFMA - Annabel Jones DSEWPaC - Celeste Powell	• Improved understanding of current sources of pollution to marine ecosystems and public health • Establishment of an ongoing monitoring program that	• Dependent on input and effective engagement with TSRA's LSMU and Ranger team. • Dependent on effective engagement with TSIRC.	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		management interventions • Improved TS ranger capacity in understanding of TS water quality issues	data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU • Presentation at annual NERP TE Hub conference (researchers)	TSIRC - Patrick McGuire	would allow reporting on the status of water quality in the Torres Strait • Improved TS ranger capacity in understanding of TS water quality issues		
Program 5 – Cumulative impacts on benthic biodiversity – Fabricius							
5.1	Understanding GBR diversity: spatial and temporal dynamics and environmental drivers (Dr Glenn De'ath, AIMS)	• Enhanced knowledge and understanding of biodiversity the GBR • Identification of the main drivers of diversity on the GBR, and quantify their effects in terms of loss, gain and turnover of diversity • Diversity-based indicators of reef health • An assessment of the effects of the zoning on diversity on the GBR reefs and seafloor	• Reports describing: - The main drivers of diversity on the GBR, and their influence on loss, gain and turnover of diversity - Diversity-based indicators of reef health - The effects of the zoning on diversity on the GBR reefs and seafloor • e-Atlas map the diversities of fishes, corals, other biota and environments of the GBR at optimal spatial and temporal scales. • e-Atlas maps of the main forms of chronic and acute environmental pressures for the coral reefs and seafloor communities of the GBR	GBRMPA - David Wachenfeld, Fergus Molloy, Laurence McCook, Roger Beeden DERM - John Mullins DEEDI - Rob Coles Malcolm Dunning DSEWPAC - Celeste Powell, Kate Sanford-Readhead, Jeff Tranter AMPTO - Colin McKenzie	• Incorporation of new knowledge of the patterns of biodiversity and the main drivers of change on the GBR in the 2014 Outlook Report. • Incorporation of diversity-based indicators of reef health in Outlook and status reporting • Adoption of the outcomes of the assessment of the effects of the zoning on diversity on the		• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• e-Atlas maps available as publication quality vector graphics for use in publication, reports and presentations • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)		GBR reefs and seafloor		
5.2	Combined water quality-climate effects on coral and other reef organisms (Dr Sven Uthicke, AIMS)	• An experimental assessment of individual and synergistic effects of water quality and global change on key coral reef invertebrates to determine vulnerability • Improved understanding on climate and WQ interactions that will allow changes in thresholds and consequences of improved land management to be modelled.	• Reports describing: - Changes in the thresholds for global change stressors (temperature increase, ocean acidification) due to elevated local stressors, (increased nutrients, increased turbidity, decreased salinity) on key coral reef organisms. - Predictions of the future performance of reef organisms, based on the empirically tested vulnerability of coral species to ocean acidification - The performance of calcifying organisms at low or variable	GBRMPA - Paul Marshall, Hugh Yorkston, Katherine Martin Reef Rescue - Kevin Gale DERM - John Bennett Reef Plan Secretariat – Grahame Byron DEEDI - Adam West Canegrowers - Matt Kealley MLA - Mick Quirk WWF - Nick Heath,	• Improved knowledge of combined water quality-climate effects on coral and other reef organisms and the likely implications for reef resilience • Adoption of refined thresholds of concern based on improved understanding	• Dependent on effective engagement with the Marine Monitoring Program (GBRMPA) • Dependent on effective engagement with NERPTE projects 1.1, 4.1 and 9.1	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		• More accurately defined thresholds of concern for several stressors in combination • Understanding of how single stressors or combinations of stressors can affect reef resilience and diversity • Improved understanding of mechanisms leading to contrasting tolerances of corals to ocean acidification, and the flow-on effects on coral reef communities • Improved understanding of the carbonate saturation conditions on coral reefs exposed to terrestrial runoff, and the consequences for photosynthesis and calcification of coral recruits and coralline algae	carbonate saturation state. • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)	Juliette King DSEWPaC – Celeste Powell	on climate and WQ interactions • Incorporation of research outcomes in 2014 Outlook Report.		
5.3	Vulnerability of seagrass habitats in the GBR to changing coastal environments (Dr Catherine Collier, JCU)	• Quantified level of exposure of seagrass meadows to broadscale and long-term changes in water quality associated with flood plumes in coastal regions of the GBR. • Exposure maps to flood	• Reports describing: - The level of exposure of seagrass meadows to broadscale and long-term changes in water quality associated with flood plumes in coastal regions of the GBR - the impacts of light, nutrients	DEEDI - Phil Hales, John Beumer GBRMPA - Katherine Martin DERM - Michael Warne Reef Rescue - Kevin Gale	• Improved understanding of the impacts of light, nutrients and salinity on seagrass health • Adoption of experimentally	• Dependent on effective engagement with the Marine Monitoring Program (GBRMPA) • Dependent	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		plumes in coastal regions of the GBR; • An experimental assessment of the impacts of light, nutrients and salinity on seagrass health leading to improved thresholds of concern for light, nutrients and salinity • Experimentally tested indicators of seagrass status • Improved understanding of future trajectories for GBR ecosystems, which will contribute to risk assessments for the GBR (e.g. GBRMPA Outlook)	and salinity on seagrass health - Refined thresholds of concern for light, nutrients and salinity - Indicators of seagrass status - Future trajectories for GBR ecosystems • Informal updates through regular Reef Rescue MMP meetings, the annual MMP integration and synthesis workshop and Paddock to Reef reporting • e-Atlas maps illustrating exposure to flood plumes in coastal regions of the GBR; • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	Reef Plan Secretariat - Chris Chinn DSEWPaC – Celeste Powell, Lesley Gidding, Kate Sanford-Readhead, Jeff Tranter	tested indicators of seagrass status in MMP	on effective engagement with Paddock to Reef Program (DPC).	
Program 6 – Movements and habitat use by marine apex predators – Simpfendorfer							
6.1	Maximising the benefits of mobile predators to GBR ecosystems: the	• Acoustic tracking of sharks and other large predators to map habitat	• Report describing: - spatial utilisation of target species to define the presence of	DSEWPaC - Nathan Hanna, Kate Sanford-Readhead,	Improved understanding of how to spatially manage marine	• Dependent on effective collaboration	• Interactive maps, data visualisation

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
	importance of movement, habitat and environment (Dr Michelle Heupel, AIMS)	use and determine the protection from fishing offered by current spatial management • Improved understanding of broad scale movements of target species between inshore and reef habitat and among reef platforms • Evaluation of current management approaches for target species and potential options to better protect these mobile predator species	individuals within specific habitat regions (ie, inshore, reef, etc) and the amount of time spent within marine park zones - The extent of movement between inshore and reef habitat and among reef platforms to define broad scale movements of target species and how these movements may play a role in reproduction or other behaviours - The integration of movement data with environmental conditions and habitat to identify links between habitat occupation and usage and environmental conditions. - The assessment of current management approaches for target species and potential options to better protect these mobile predator species • e-Atlas maps of predator movements and habitat usage • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers)	Jeff Tranter GBRMPA - Mark Read, Randall Owens DEEDI - Bonnie Holmes QSIA - Winston Harris CapReef - Bill Sawynok	predators Identification of alternative approaches to managing marine predators	with DEEDI	s and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)				
6.2	Drivers of juvenile shark biodiversity and abundance in inshore ecosystems of the GBR (Dr Colin Simpfendorfer, JCU)	• An assessment of the spatial heterogeneity and temporal changes in inshore shark biodiversity along the central GBR • Greater understanding of seasonal and inter-annual trends in shark biodiversity between different nursery areas and examine the drivers that lead to differences • Greater understanding of the influence of environmental factors on juvenile sharks and what implications these have for the management and conservation of shark populations and inshore habitats in the GBR • At least three PhD theses	• Reports describing - The spatial heterogeneity of inshore shark biodiversity along the central GBR coast, which includes analysis of DEEDI commercial inshore net fishing logbook data - The temporal changes in inshore shark biodiversity along the central GBR coast - The effects of environmental drivers on the movement, distribution and habitat use of juvenile sharks in coastal and inshore island nursery areas • e-Atlas maps of juvenile shark density, habitat usage and changes over time • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate	GBRMPA - Randall Owens, Mark Read, Rachel Pears DEEDI - Malcolm Dunning, Julia Davies QSIA - Winston Harris DSEWPaC – Lesley Gidding, Nathan Hanna, Kate Sanford-Readhead, Jeff Tranter	Improved understanding of factors affecting the functioning of shark nursery areas Improved management of shark populations in the GBRWHA	• Dependent on effective collaboration with DEEDI and GBRMPA.	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas.

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			(JCU) • Presentation at annual NERP TE Hub conference (researchers)				
6.3	Critical seabird foraging locations and trophic relationships for the GBR (Dr Brad Congdon, JCU)	• Maps of shearwater and booby foraging locations from specified seabird colonies in relation to oceanographic conditions during breeding and non-breeding seasons • Greater understanding of the characteristics of the species-specific biophysical-oceanographic foraging environment at each foraging location • Identification of the principal foraging locations for shearwaters and boobies breeding at the most important colonies of the GBR, both within and between breeding seasons • Greater understanding of how prey availability at these sites varies with climate driven changes in biophysical oceanography, both within and among breeding seasons	• e-Atlas maps of shearwater and booby foraging locations during breeding for populations at specific GBR sites • e-Atlas maps of shearwater/booby foraging locations and oceanographic correlates during the non breeding season • e-Atlas maps of long-term climatologies, monthly and short-term means and anomalies for the GBR and Coral Sea region • Reports describing: - The characteristics of the species-specific biophysical-oceanographic foraging environment at each foraging location and along foraging paths - foraging locations and correlations of foraging success on indexes/charts of commercial fishing activity - Colony-specific estimates of foraging success and oceanographic parameters within which reproductive success remains viable • e-Atlas metadata record to	GBRMPA/QPWS - Malcolm Turner GBRMPA - Paul Marshall, Roger Beeden BOM/CSIRO/NARP - Lynda Chambers AFMA - Steve Auld DEEDI - Malcolm Dunning DSEWPaC – Celeste Powell, Kate Sanford-Readhead, Jeff Tranter, Lesley Gidding	Improved understanding of linkages between oceanographic processes and seabird population in the GBR Improved management of the GBR to enhance outcomes for seabird populations	• Dependent on access to oceanographic information (UQ)	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		• Greater understanding of the level of prey availability and associated oceanographic conditions required to maintain viable reproduction at significant breeding colonies	ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
Program 7 – Threats to rainforest health – Metcalfe							
7.1	Fire & rainforests (Dr Dan Metcalfe, CSIRO)	• Understanding impacts of cyclone Yasi, and subsequent effects of fire on mahogany glider habitat	• e-Atlas maps illustrating impacts of TC Yasi on mahogany glider habitat, levels of rainforest invasion, and impacts of fire on succession • Reports describing: - Initial assessment and potential long-term monitoring of impacts of TC Yasi on mahogany glider habitat, levels of rainforest invasion, and impacts of fire on succession. - Assessment of areas of greatest concern, and understanding of impacts of fire on LR&CVToEA - potential for and impacts of fire on Mabi forest - Key criteria to be used in assessing where and whether	QPWS - Andrew Millerd WTMA - Steve Goosem Terrain NRM - Rowena Grace Cassowary Coast Regional Council - Damon Sydes DSEWPaC - Kate Sanford-Readhead, Jeff Tranter		• Dependent on effective engagement with WTMA and DERM.	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			expansion of rainforest is desirable, together with mapping and assessment of where critical impacts of fire may be • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)				
7.2	Invasive species risks and responses in the Wet Tropics (Dr Helen Murphy, CSIRO)	• Improve knowledge about the pathways of spread of invasive species in the Wet Tropics • Identification of important source populations of invasives in the Wet Tropics • Identification of important connecting elements in the landscape for spread • A population-level prioritisation approach for strategic invasive	• A user's manual on the development and implementation of a spatial population prioritisation framework for weed management • Regular workshops with research-users to facilitate ownership and uptake of the prioritisation process and results • Regular presentations of the results and outputs of the work at regional stakeholder meetings • Training workshops targeted at all levels of weed management from ground control crews, to	QPWS - Andrew Millerd WTMA - Steve Goosem Terrain NRM - Rowena Grace; Cassowary Coast Regional Council - Damon Sydes DSEWPaC – Damian McRae, Celeste Powell, Kate Sanford-Readhead, Jeff Tranter	• Explicit incorporation of data and results of the prioritisation process into the existing regional Local Government Natural Assets registers and regional invasive species and landscape management planning and delivery	• Dependent on effective engagement with WTMA, DERM and Cassowary Coast Regional Council • Dependent on regional Pest and Weeds Web Portal and the Weeds Web Portal being	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		species management in the Wet Tropics • Examination of alternative approaches to the on-ground management of suites of invasive species • An accessible platform of data for future and ongoing scenario-based planning and bio-economic modeling • Contribution to regional invasive species and landscape management planning and delivery • Maps of populations and communities that are sources of propagules for invasive weeds; • Report and model of feral pig/management interaction	managers, to policy makers on the use of prioritisation tools developed during the project • Communications platform via an interactive Web Portal, integrated with the existing regional Pest and Weeds Web Portal and the Weeds Web Portal being developed by SEWPaC to facilitate information exchange regarding emerging and future weed threats, to provide results of the current project and facilitate use of data for future and ongoing scenario-based planning and bio-economic modeling • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)			developed by SEWPaC • Dependent on enduser participation in workshops	
7.3	Climate change and the impacts of extreme events on Australia's Wet	• Information and tools to enable scientists and management agencies to predict and limit the	• e-Atlas high resolution maps of the exposure to temperature extremes as experienced by	WTMA - Steve Goosem, Andrew Maclean		• Dependent on effective engagement with key	• Interactive maps, data visualisations and

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
	Tropics biodiversity (Dr Justin Welbergen, ANU)	impacts of extreme climatic events on Australia's biodiversity • Understanding the risks and threats to rainforest biodiversity under climate change • Understanding of the drivers of rainforest biodiversity patterns and change • estimates of the sensitivities of organisms to temperature extremes • Identification of the areas where biodiversity is currently most vulnerable to temperature extremes ('thermal hotspots') • Identification of the areas where biodiversity is least vulnerable to temperature extremes in the future ('thermal refugia') • A list of biodiversity values particularly at risk from extreme events • A generalised analytical toolkit for assessing vulnerability to extreme climatic events including generation of high	organisms in-situ • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • A generalised analytical toolkit for assessing vulnerability to extreme climatic events including generation of high resolution maps on exposure to extreme temperatures • Reports on: - The risks and threats to rainforest biodiversity under climate change - The drivers of rainforest biodiversity patterns and change - The identification of the areas where biodiversity is currently most vulnerable to temperature extremes ('thermal hotspots') - The identification of the areas where biodiversity is least vulnerable to temperature extremes in the future ('thermal refugia') • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (ANU)	DERM - Wolf Sievers, Andrew Millerd Terrain NRM - Rowena Grace, Carol Sweatman DSEWPaC – Celeste Powell		management agencies to develop management tools.	metadata storage dependent on support for e-Atlas • Publishing assistance (if required) of toolkit.

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		resolution maps on exposure to extreme temperatures	• Presentation at annual NERP TE Hub conference (researchers)				
THEME 3							
Program 8 – Effectiveness of spatial management on the GBR – Sweatman							
8.1	Monitoring the ecological effects of GBR zoning plan on mid and outer shelf reefs (Dr Hugh Sweatman, AIMS)	• Measurements of the impact of no-take areas created by the 2004 rezoning of the GBRMP upon fish, coral and *Acanthaster* • Provision of information to the GBRMPA and the Australian Community about the developing effects of rezoning the GBRMP in 2004	• Reports on: - Changes to benthic and fish communities on AIMS survey reefs associated with Cylones Hamish and Yasi - Dynamics of populations of target fish species fished reefs compared with similar reefs that are closed to fishing in five regions of the GBR Marine Park - Contribution of information on the effects of zoning for inclusion in the Outlook Report 2014 - Indirect effects of protection from fishing in terms of populations of non-target fish species - Potential ecosystem effects of protection from fishing, such as increased coral recruitment and coral cover due to increased herbivorous fish numbers, and reduced incidence of coral disease • e-Atlas metadata record to ensure broad discoverability of data and research outcomes	GBRMPA -David Wachenfeld, Laurence McCook AMPTO - Col McKenzie DEEDI - Malcolm Dunning DSEWPaC - Kate Sanford-Readhead, Jeff Tranter	• 2012/2013 survey results used in GBRMPA's 2014 Outlook Report • Number of briefings provided by project leader to research users	• Dependent on effective engagement with GBRMPA.	• Metadata storage dependent on support for e-Atlas • Website required for public information disseminatio n

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)				
8.2	Assessing the long-term effects of management zoning on inshore reef of the GBR (Prof Garry Russ, JCU)	• Measuring the impact of no-take areas upon fish populations of importance to the recreational sector; • Estimates of levels of non-compliance	• Reports on: - effects of no-take zoning on targeted and non-targeted reef fish species - variations in fish assemblage structure due to NTR protection and natural disturbance events - natural and fishing induced mortality of exploited species - benthic community structure and dynamics - coral health, bleaching, incidence and severity of disease and coral predators • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as	GBRMPA - Laurence McCook, David Wachenfeld, Fergus Molloy CapReef - Bill Sawynock DEEDI - Brigid Kerrigan WA DEC - Chris Simpson		• Dependent on effective engagement with GBRMPA and DEEDI	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
8.3	Significance of no-take marine protected areas to regional recruitment and population persistence on the GBR (Prof Geoff Jones, JCU)	• Empirical estimates of recruitment subsidies to fished areas (Blue Zones) by coral trout spawning within no-take areas (Green Zones) in the southern GBR • Empirical estimates of recruitment subsidies for both *P. maculatus* and *P. leopardus* over a >200km scale on the southern GBR, quantifying larval retention within and connectivity among inshore (Keppel Islands, Percy and Duke Islands) and offshore reefs • a new set of hyper-variable microsatellites for *P. maculatus* and *P. leopardus* for examining parent-offspring relationships • Refined biophysical model including new information on coral trout larval behaviour, larval sensory abilities	• Reports on: - Empirical estimates of recruitment subsidies for both *P. maculatus* and *P. leopardus* quantifying larval retention within and connectivity among inshore and offshore reefs - a new set of hyper-variable microsatellites *for P. maculatus* and *P. leopardus* for examining parent-offspring relationships - coral trout larval behaviour, larval sensory abilities - Spatially explicit meta-population models that evaluate the effects of reserve network design, differential production in reserves and fishing pressure outside reserves on long-term population persistence • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as	GBRMPA - Laurence McCook, David Wachenfeld, Fergus Molloy CapReef - Bill Sawynock DEEDI - Brigid Kerrigan WA DEC - Chris Simpson			• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		and availability of critical recruitment habitat to better predict regional recruitment patterns • Spatially explicit meta-population models that incorporate real data on larval dispersal to evaluate the effects of reserve network design, differential production in reserves and fishing pressure outside reserves on long-term population persistence	requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
Program 9 – Decision support systems for GBR managers – Pressey							
9.1	Dynamic Vulnerability Maps and Decision Support Tools for the Great Barrier Reef (Dr Ken Anthony, AIMS)	• A novel framework for linking impacts of environmental change to spatial patterns of coral reef resilience and vulnerability • Experimental calibration of biological/ecological responses to multiple environmental variables • A baseline resilience/vulnerability dataset • Dynamic vulnerability maps for the GBR will be made available in e-Atlas • A reef vulnerability	• Reports on: - Experimental calibration of biological/ecological responses to multiple environmental variables - A novel framework for linking impacts of environmental change to spatial patterns of coral reef resilience and vulnerability • Output data from the experimental calibration of biological/ecological responses to multiple environmental variables delivered through e-Atlas • Dynamic vulnerability maps for the GBR will be made available	GBRMPA - Roger Beeden, Paul Marshall, David Wachenfeld DEEDI - Brigid Kerrigan DSEWPaC - Kate Sanford-Readhead, Jeff Tranter			• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		decision support system to guide spatial planning of the GBRMP under projected scenarios of climate change, ocean acidification and water quality	in e-Atlas • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)				
9.2	Design and implementation of management strategy evaluation for the GBR (Dr Cathy Dichmont, CSIRO)	• An understanding of the relative importance of different objectives for each stakeholder group and for all stakeholders combined • A qualitative model of the system allowing stakeholder input to develop a joint understanding of the inshore system • Comparison of existing and new management strategies and an assessment of their relative impacts • Management options aimed at biodiversity	• Reports on: - The social, ecological, economic and governance objectives of stakeholders for the inshore Great Barrier Reef region, including the fisheries therein. - The development of a qualitative system model of the region to understand the interactions between the various components of the region. - Alternative strategies for the management of the inshore region, using a stakeholder driven approach. - The impacts of the management strategies against each objective using a semi-quantitative	GBMPA - Laurence McCook, Mark Read DEEDI - Mark Lightowler DERM - Julia Playford, Michael Warne, John Bennett DSEWPaC - Kate Sanford-Readhead, Jeff Tranter		• Completely dependent on the effective engagement of DEEDI, DERM and GBRMPA.	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		outcomes, focusing on inshore multi-species fisheries management	approach. - Management options (with research-users) aimed at biodiversity outcomes, focusing on inshore multi-species fisheries management. • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)				
9.3	Prioritising management actions for GBR islands (Prof Bob Pressey, JCU)	• A novel, cost-effective, and transparent approach to prioritizing management actions for multiple objectives across islands in a selected sub-region of the GBR • Compilation of all available data, including expert judgements, on islands in the sub-region to set parameters for key variables to be used in	• Reports on: - The identification of key variables and parameters to be used in the management prioritization, considering uncertainty - The production of a decision-support tool with GIS interface for day-to-day use that will allow managers to identify spatially explicit and action-specific management priorities within and between islands • e-Atlas metadata record to	DERM - John Hicks GBRMPA - Malcolm Turner AMPTO - Colin McKenzie DSEWPaC – Celeste Powell		• Highly dependent on effective engagement with GBRMPA and DERM. • Dependent on the production of a decision-support tool with GIS interface.	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		the management prioritization, considering uncertainty • An interactive, spatially explicit decision-support tool for day-to-day use that will allow managers to identify action-specific management priorities within and between islands	ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
9.4	Spatial planning for coastal development in the GBR region (Prof Bob Pressey, JCU)	• Examination of governance and potential effectiveness of new instruments for management through the development of generalised and, for sub-regions, detailed models considering climate change, change in land use and infrastructure, and effects of land uses on water quality in the Great Barrier Reef lagoon • Compilation of all available data on coastal ecosystems and their biodiversity patterns and processes and key socio-economic variables, as input to conservation planning and as a	• e-Atlas maps of: - Regional ecosystems and coastal habitats; - Threatened species; - Functionality and connections between coastal ecosystems, mediated by movements of animals, plant propagules, and organic and inorganic material; - Land tenure and uses; - Recreational and commercial uses of coastal, estuarine and inshore marine ecosystems; - Opportunities for and constraints on conservation management, indicated by tenure, traditional ownership, and commercial, industrial and recreational uses • Reports on: - The development of spatially	DERM - John Mullins Reef Plan Secretariat – Grahame Byron GBRMPA - Hugh Yorkston AMPTO - Colin McKenzie Reef Rescue - Kevin Gale DEEDI - Adam West, Malcolm Dunning Terrain NRM - Fiona Barron NQ Dry Tropics NRM - Ian Dight Reef Catchments NRM - Carl Mitchell Fitzroy Basin Association - Nathan		• Highly dependent on effective engagement with all stakeholders involved in coastal management. • Dependent on effective engagement with the Reef Plan Secretariat • Dependent on available data on coastal ecosystems	• Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		foundation for modelling change • A comprehensive set of quantitative and, where necessary, qualitative goals for coastal ecosystems and their biodiversity patterns and processes and for development, access and use of the coastal zone • An assessment of the strengths and limitations of governance in the coastal zone, with insights into how governance can be better coordinated and recommendations on the feasibility and potential effectiveness of new instruments for management	explicit representations of alternative futures for the coastal zone - The identification of explicit conservation goals for biodiversity pattern and process and goals for coastal development - An analysis of the structural and functional aspects of governance of the coastal zone, including a review existing decision-making arrangements, and trial strategic improvements in governance arrangements • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (UQ) • Presentation at annual NERP TE Hub conference (researchers)	Johnson Burnett Mary Regional Group - Fred Bennett WWF -Nick Heath QSIA -Winston Harris DSEWPaC - Kate Sanford-Readhead, Jeff Tranter			
Program 10 – Socio-economic value of GBR goods and services – Lane							
10.1	Social and economic long-term monitoring program	• Design and implementation of a long-term social and economic monitoring	• Reports on: - The development of a long-term social and economic monitoring	GBRMPA - Dave Wachenfeld, Margaret Gooch,	• Strong liaison with GBR stakeholders of the social and	• Highly dependent on the effective	• Metadata storage dependent on support

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
	(SELTMP) (Dr Nadine Marshall, CSIRO)	programme for the GBR region; • Status and trends of socio economic data in the GBR	program - The status and trends of socio economic characteristics of each of the seven major stakeholder groups of the GBR • Three presentations to stakeholder groups • Direct assistance with delivering to the Outlook report in 2013 and 2014 • Shorter reports as required • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)	Peter McGinnity QSIA - Winston Harris AMPTO - Col McKenzie FRDC - Crispian Ashby DEEDI - Kirrily McInnes, Michelle Winning Tourism Queensland - Dave Morgans QPWS/DERM - John Hicks	economic status of the region • GBR management and industries with better access to social and economic information necessary for planning purposes	consultation and engagement of the seven major stakeholder groups of the GBR. • Dependent on effective engagement with GBRMPA	for e-Atlas
10.2	Socio-economic system and reef resilience (Dr Natalie Stoeckl, JCU)	• Improved understanding of a diverse range of stakeholder views on the relative 'value' of the different goods and services provided by the reef; • Improved understanding	• Reports on: - stakeholder views on the relative 'value' of the different goods and services provided by the reef - the relative importance of different attributes of reef health to a range of different types of	GBRMPA - Margaret Gooch DERM - Doug Yuille, Gaye Crawley TTNQ - Rob Giason DEEDI - Peter Donaghy. Brigid Kerrigan, Adam		• Dependent on effective consultation and engagement with various Reef stakeholders	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		of the relative importance of different attributes of reef health to a range of different types of tourists; • Improved understanding of the way in which external socio-economic pressures (such as rising commodity prices) have, historically, affected water quality and thus (indirectly) reef resilience; • Continued the long term tourism monitoring • Improved ability to assess the relative importance (or 'value') of different market and non-market goods and services using both monetary and non-monetary approaches; • Identification of potentially useful indicators and methods for measuring those indicators for long term monitoring.	tourists - the way in which external socio-economic pressures (such as rising commodity prices) have, historically, affected water quality and thus (indirectly) reef resilience - Status and long term trends in tourism - alternative methods for assessing the relative value of non-market goods and services - potentially useful indicators and methods for measuring those indicators for long term monitoring • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	West, Kirrily McInnes, Michelle Winning, Lew Williams QSIA - Winston Harris Sunfish - Barry Pollock Alliance for Sustainable Tourism - John Courtenay AMPTO - Col McKenzie		. • Dependent on effective engagement with Paddock to Reef Program (DPC) and Reef Rescue Research and Developmen t team (SEWPaC)	
Program 11 – Resilient Torres Strait communities – Butler							
11.1	Building resilient communities for	• Improved capacity of communities and	• Reports on: - Downscaled climate projections	TSRA - John Rainbird AFMA - Annabel	To be determined by the Steering	• Dependent on the	• Metadata storage

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
	Torres Strait futures (Dr James Butler, CSIRO)	stakeholders in the Torres Strait to anticipate and respond pro-actively to future sustainability challenges through: - Increased awareness of drivers of change at local and larger scales - Exploration of alternative livelihoods and 'best bet' strategies and policies - Increased capacity to avoid mal-adaptive strategies - Development of community-based holistic plans to support adaptation planning for climate change and sustainability challenges - Enhanced design and delivery of relevant international, national and regional policies and strategies for building sustainable and resilient communities. • Typology of TS and PNG Treaty Village livelihoods; • Valuation of ecosystem goods and services underpinning Torres	to 8 km2 for 2030, 2060 and 2090 for Torres Strait and Western Province, PNG, using the CSIRO-BoM Conformal-Cubic Atmospheric Model; - Synthesis and projections of human population and socio-economic trends in Torres Strait and Western Province, PNG; - Identification and valuation of ecosystem services underpinning Torres Strait livelihoods and other beneficiaries; - Typology of Torres Strait and PNG Treaty Villages' livelihoods based on collation of existing data (e.g. ABS for Australia) and surveys (e.g. PNG Treaty Villages); - Collation and integration of status and trends data from NERP Program 2 Natural Resources of the Torres Strait Land and Sea. • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE	Jones QLD Govt – John O'Halloran DEWPaC International Section - John McDougall, Bruce Edwards DFAT - Simon Moore DEEDI – Anne Clarke	Committee	formation and effective engagement of a Project Steering Committee. • Dependent on effective engagement of TSRA.	dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		Strait livelihoods and other beneficiaries	conference (researchers)				
11.2	Determining disease dynamics across the Torres Strait and improved approaches for disease detection and management. (Dr Sue Laurence, JCU)	• Improved approaches to biosecurity through detection and prevention of wildlife diseases in the Torres Strait. • Improved methodology for detecting the establishment and persistence of disease incursions in the Torres Strait	• Report on: - the influence inter-island and PNG Western Province traffic on insect vectors of disease and the subsequent the disease load of birds - the identification of appropriate responses for minimizing the risks associated with disease incursion • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)	Biosecurity Queensland AQIS TSRA Biosecurity Team DSEWPaC – Damian McRae	• Increased capacity to protect the Torres Strait biodiversity and peoples from disease incursions	• Dependent on the effective engagement of TSRA's LSMU and Ranger Team. • Dependent on the effective engagement of DEEDI, TSRA Biosecurity and AQIS.	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
Program 12 – Managing for resilience in rainforests – Hill							
12.1	Indigenous peoples and protected areas (Dr Ro Hill, CSIRO)	• Advice on effective approaches to collaborative governance, planning and co-management of Indigenous Protected Areas and parks as a means of delivering biodiversity and Indigenous cultural conservation in the WTWHA • Greater understanding of how, under what conditions and why Indigenous protected areas and other collaborative models and tools integrate social values and institutions at the landscape scale to deliver effective joint management for biodiversity and cultural conservation. • Greater understanding of the implications of Indigenous engagement in management of the WTWHA for Australia's national and international biodiversity and cultural conservation obligations	• Report on: - progress with establishment of co-research partnerships with Indigenous, government and other stakeholders - Identification of a testable framework, to establish clear justification and conditions for participatory conservation approaches to deliver joint management of the WTWHA • Workshop on Indigenous peoples and protected areas, with key government, Indigenous and other collaborators • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (CSIRO) • Presentation at annual NERP TE Hub conference (researchers)	Girringun Aboriginal Corp - Phil Rist WTMA - Andrew Maclean JabalbinaYalanji Aboriginal Corporation - Paul Barrett DERM - Andrew Millerd, Ross McLeod, Lyn Wallace CWTICCAC - Joann Schmider DSEWPaC - Bruce Rose, Marcus Sandford, John Hunter MandingalbayYidinji - Dale Mundraby Terrain NRM - Carole Sweatman, Steve McDermott CYPSCAC - Nigel Stork	Enhanced capacity of Traditional Owner and Wet Tropics World Heritage Managers to engage equitably in protected area governance, planning and management. Engagement by TOs in co-research partnerships No. of meetings with research users and co-researchers about the research.	• Highly dependent on the effective engagement of Indigenous, government and other stakeholders . 	• Metadata storage dependent on support for e-Atlas.

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
12.2	Harnessing natural regeneration for cost-effective rainforest restoration (Prof Carla Catterall Griffith/ Dr Luke Shoo UQ)	• A review and synthesis of approaches to managing and accelerating vegetation regrowth including a list of potential management interventions; • DSS for passive versus active replanting strategies • Scoping of regrowth ages and landscape context in the Wet Tropics uplands, in relation to previous mapping • Data on vegetation development during regrowth • List of potential management interventions to accelerate regrowth development relevant to the Wet Tropics uplands • Analysis of factors that constrain or facilitate development of regrowth	• Paper on developmental rates of regrowth compared with replanting • Fact Sheet on outcomes, management and optimal locations for natural regrowth • Synthesis paper on approaches to managing and accelerating regrowth • Fact Sheet on outcomes, management and optimal locations for natural regrowth • Decision Analysis to identify situations where passive restoration represents a more cost effective management option than active restoration in meeting restoration objectives • Fact Sheet on outcomes, management and optimal locations for natural regrowth • e-Atlas map identifying high suitability areas for regrowth establishment across degraded land • interactive involvement of various stakeholder organisations throughout the project • joint roles of some project staff who work both within the project and in stakeholder organisations	WTMA - Steve Goosem, Deborah Pople, Bruce Jennison; Max Chappell Terrain NRM - Carole Sweatman, Steve McDermott, Rowena Grace, Penny Scott DERM - Keith Smith, Don Butler, Peter Scarth FNQROC - Travis Sydes CVA - Dave Hudson DSEWPaC – Celeste Powell		• Completely dependent on the effective and interactive involvement of various stakeholder organizations including the incorporation of joint roles of some project staff to work between project and stakeholder organizations.	• Publishing for reports, papers and factsheets. • Interactive maps, data visualisations and metadata storage dependent on support for e-Atlas.

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (Griffith, UQ) • Presentation at annual NERP TE Hub conference (researchers)				
12.3	Relative social and economic values of residents and tourists in the WTWHA (Dr Natalie Stoeckl, JCU)	• Improved understanding of the relative importance or 'value' of the WTWHA's key environmental attributes to different stakeholders (e.g. Tourists, Indigenous and Non-Indigenous Residents, the owners of different types of businesses). • Predictions about the way in which resident and tourist 'values' and thus management, conservation and marketing priorities may alter in the future as both population and tourist numbers change. • Improved methods for assessing 'values'.	• Reports on: - the relative importance or 'value' of the WTWHA's key environmental attributes to different stakeholders - the way in which resident and tourist 'values' and thus management, conservation and marketing priorities may alter in the future as both population and tourist numbers change. - Improved methods for assessing 'values' • e-Atlas metadata record to ensure broad discoverability of data and research outcomes • Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers)	WTMA - Andew Maclean Terrain NRM - Rowena Grace Alliance for Sustainable Tourism - John Courtenay		• Dependent on the effective engagement of a range of stakeholders of the WTWHA (e.g. Tourists, Indigenous and Non-Indigenous Residents, the owners of different types of businesses).	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
			• Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
12.4	Governance, planning and the effective application of emerging ecosystem service markets: climate change adaptation and landscape resilience (Dr Allan Dale, JCU)	• Recommendations on the most appropriate regional governance systems and planning mechanisms to support adaptation to climate change in the Wet Tropics region • A stronger theoretical foundation for devising more appropriate governance systems and institutional arrangements • A stronger theoretical foundation for devising more appropriate planning approaches for climate adaptation and the guidance of ecosystem service markets • Knowledge developed regarding improved planning for regional climate change adaptation planning and the guidance of carbon and other ecosystem service markets	• Reports on: - The development and testing of theory concerning the governance and institutional arrangements needed for regional climate change adaptation - The development and testing of theory concerning the integrated and effective use of regional scale adaptation planning - the most effective linkages between region planning and outcome delivery via the application of emerging ecosystem service markets, including the aggregation of carbon and other ecosystem services at regional scale - practical reforms required to improve the regional governance and planning systems required and linkages needed to effectively guide carbon-based and other emerging ecosystem service markets • Science summary section from six-monthly milestone reports provided to specified research users (RRRC)	Terrain NRM - Carole Sweatman CYPNRM - Bob Frazer QRCC - Mike Berwick WTMA - Andrew Maclean DIP - Robyn Clark FNQROC - Darlene Irvine RDA FNQ&TS - Rene Nusse	• Higher quality regional NRM plans over the next three years; • These plans guiding the emerging ecosystem service market; • Greater capacity within this region to enable market mobilization; • Inform national and state-wide policy on both these fronts	• Dependent on the effective engagement of NRM bodies and other government agencies.	• Metadata storage dependent on support for e-Atlas

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
		• Explicit practical reforms required in regional governance and NRM planning systems developed and trialed to effectively guide carbon-based and other emerging ecosystem service markets.	• Briefings to key research users as requested (researchers) • Media releases as appropriate (JCU) • Presentation at annual NERP TE Hub conference (researchers)				
Program 13 – Communications and Knowledge Brokering							
13.1	e-Atlas (GBR) (Dr Eric Lawrey, AIMS)	• A linked website and mapping system containing a compilation of NERP GBR and Torres Strait research outcomes, reference data.	• Science summary section from six-monthly milestone reports provided to specified research users (RRRC) • Briefings to key research users as requested (researchers) • Media releases as appropriate (AIMS) • Presentation at annual NERP TE Hub conference (researchers)	GBRMPA - Cherie Malone DEEDI - Malcolm Dunning, Anne Clarke WTMA - Michael Stott Reef Plan Secretariat - Chris Chinn Reef Rescue - Kevin Gale DERM - John Bennett Terrain NRM - Fiona Barron NQ Dry Tropics - Ian Dight Reef Catchments NRM - Carl Mitchell Fitzroy Basin Association - Nathan Johnston		• Highly dependent on the effective collaboration and engagement with all NERP TE Hub project leaders and research users. • Delivery of many spatial products dependent on NERP TE Hub project leaders providing information in appropriate form for incorporation into e-Atlas	

Project (Leader)		Expected products/messages (estimated date)	Delivery mechanism (agent)	Key research users	Impact indicator	Process/ engagement needs	Other resourcing needs
				TSRA - Tony O'Keefe, Vic McGrath John Rainbird, Damien Miley Torres Strait Community - John Morris AFMA - Annabelle Jones DSEWPAC - David Johnson, Kate Sanford-Readhead, Jeff Tranter DEEDI - Ian Jacobsen, Anne Clarke Tagai College - Andrew Denzin			

Appendix 4: Details of Implementation Groups

Nominated representatives for the NERP TE Hub Implementation Groups (as at Oct 2011) ** Potential secondary interest

Participants	GBR Water Quality	GBR – Biodiversity, Health, Protection & Management	Rainforest Biodiversity	Torres Strait
Chair	**John Bennett, DERM**	**Peter McGinnitty, GBRMPA**	**Andrew Maclean WTMA**	**Walter Mackie - supported by Damian Miley, TSRA**
Program and Project leaders (Program Leaders in bold)				
	Britta Schaffelke	**Marcus Lane**	**Steve Williams (JCU)**	**Helene Marsh (JCU)**
	John Pandolfi	**John Pandolfi**	**Dan Metcalfe (CSIRO)**	**James Butler (CSIRO)**
	Katharina Fabricius	**Hugh Sweatman**	**Ro Hill (CSIRO)**	Mark Hamman (JCU)
	Andrew Negri	Mark Hamann	Darren Crayn (ATH)	Damian Burrows (JCU)
	Jon Brodie	Michelle Heupel	Robert Puschendorf (JCU)	Norm Duke (JCU)
	Glenn De'ath	**Colin Simpfendorfer**	Conrad Hoskin (JCU)	Ray Berkelmans (AIMS)
	Sven Uthicke	Brad Congdon	Helen Murphy (CSIRO)	Susan Laurance (JCU)
	Catherine Collier	Hugh Sweatman	Justin Wellbergen (JCU)	Eric Lawrey (AIMS)
	Eric Lawrey	Garry Russ	Carla Catterall (Griffith)	
		Geoff Jones	Luke Shoo (UQ)	
		Ken Anthony	Natalie Stoeckl (JCU)	
		Cathy Dichmont	Allan Dale (JCU)	
		Bob Pressey	Eric Lawrey (AIMS)	

Participants	GBR Water Quality	GBR – Biodiversity, Health, Protection & Management	Rainforest Biodiversity	Torres Strait
		Nadine Marshall		
		Natalie Stoeckl		
		Eric Lawrey		
Research users				
GBRMPA	Katherine Martin Hugh Yorkston			TBC Mark Read
TSRA				Damian Miley Walter Mackie
WTMA			Steve Goosem	
DERM	John Bennett	John Hicks	Wolf Sievers Andrew Millerd	TBC John Hicks
DEEDI	Anne Clarke	Malcolm Dunning / Brigid Kerrigan		TBC Anne Clarke
Reef Plan Secretariat	Chris Chinn	Claire Andersen		
Reef Rescue Team SEWPaC/DAFF	Kevin Gale	Kevin Gale		
SEWPaC	TBA	TBA	Peter Latch	John McDougall
Local government	FNQROC?	FNQROC?	FNQROC - Travis Sydes	
AFMA	**	Steve Auld		Annabel Jones
AMPTO	Col McKenzie	Col McKenzie		
BOM/CSIRO/NARP		Lynda Chambers		
Terrain NRM	Fiona Barron	**	Rowena Grace	
Burdekin Dry Tropics NRM	Diana O'Donnell	**		
Mackay Whitsundays NRM	Will Higham	**		

Participants	GBR Water Quality	GBR – Biodiversity, Health, Protection & Management	Rainforest Biodiversity	Torres Strait
Fitzroy Basin Association #	Nathan Johnston	**		
Burnett Mary Regional Group	Fred Bennett	**		
Tagai College				TBC
MLA	Mick Quirk	**		
Canegrowers	Matt Kealley	**		
WWF	**Nick Heath** Sean Hoobin Martin Taylor Cassandra Brooke	Nick Heath Sean Hoobin Sian Breen		
Aust Marine Conservation Society / Qld Conservation Council	**	Darren Kindleysides	**	
Conservation Volunteers Australia			Dave Hudson	
QSIA	**	Winston Harris		
CapReef	**	Bill Sawynok		
Sunfish	**	Barry Pollock		
Traditional Owners	**	Phil Rist (discuss with Melissa George)	TBC	
CAFNEC			Sarah Hoyal	
FRDC		Crispian Ashby		
Tourism Queensland		Dave Morgans		
TTNQ		Rob Giason		
Alliance for Sustainable Tourism		John Courtenay	Max Shepherd	

Participants	GBR Water Quality	GBR – Biodiversity, Health, Protection & Management	Rainforest Biodiversity	Torres Strait
Growcom			Keith Noble TBC	
Science Leader	Peter Doherty	Peter Doherty	Peter Doherty	Peter Doherty
RRRC staff	Sheriden Morris	Sheriden Morris	Sheriden Morris	Sheriden Morris
	Michelle Devlin / Jane Waterhouse / Jo Johnson	David Souter	Mellissa Jess	Mellissa Jess
		Hayley Gorsuch		

Appendix 5: Implementation Group Terms of Reference

1. Purpose

The National Environmental Research Program (NERP) Tropical Ecosystems (TE) Hub Implementation Groups will provide advice to the NERP TE Hub Steering Committee on research conducted by the NERP TE Hub. The Implementation Groups will be comprised of members invited by the Chair of the Steering Committee and the Science Leader in consultation with Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), the Great Barrier Reef Marine Park Authority (GBRMPA), the Wet Tropics Management Authority (WTMA) and the Torres Strait Regional Authority (TSRA).

Four Implementation Groups will be established for the NERP TE Hub:

- Torres Strait;
- Rainforest Biodiversity;
- Great Barrier Reef – Water Quality; and
- Great Barrier Reef – Biodiversity, Health, Protection and Management.

2. Functions

The primary function of the Implementation Groups is to provide a mechanism for effective communication and engagement between research-users and researchers to ensure maximum uptake of the NERP products/outputs. A secondary function is to promote operational efficiency, such that synergies between closely related projects and activities can be exploited, thereby ensuring necessary integration of products/outputs and reducing the potential for duplication of effort not only in the communications sphere but more generally.

The Implementation Groups will:

1. Provide guidance and advice on any anticipated variations to the scope of relevant research programs/projects to achieve the above functions and in the light of changing circumstances. Guidance will focus on variations that:
    a. Improve the relevance and usefulness of project products/outputs to research users;
    b. Improve, integrate or facilitate engagement with research users; and
    c. Strengthen the outcomes/uptake of the research.
2. Provide proposals for funding of communications and knowledge brokering activities to the NERP TE Hub Science Communication Competitive fund.
3. Provide advice and recommendations to the Steering Committee and the Science Leader on the progress of research (both individual projects and program-wide); particularly against the objectives of the NERP TE Hub Science Communications Plan.

The relationships between the Implementation Groups and other components of the Hub (in terms of communication) are illustrated in Figure 1.

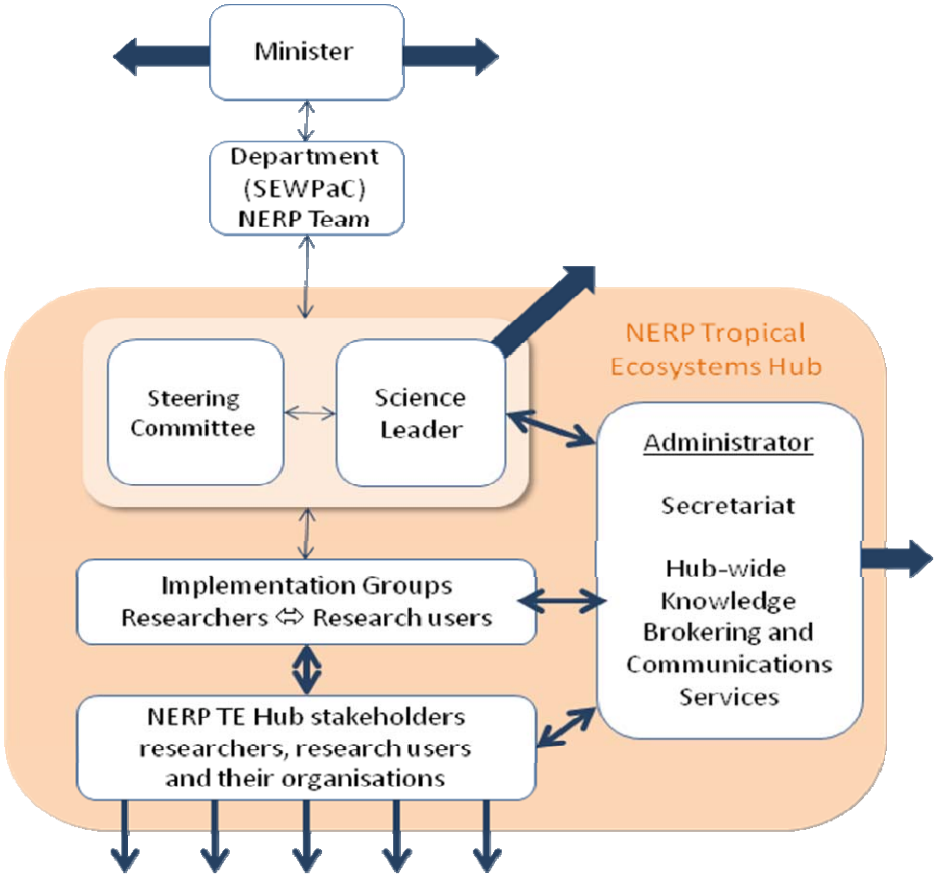

Figure 1. Schematic of relationships between NERP TE Hub components with respect to science communication. Thicker arrows indicate greater volumes of communications activity. For example, the Science Leader is the primary representative of the Hub to external stakeholders, and will be supported in this activity by the Hub-wide services provided by the Administrator.

3. Membership

In most cases, Implementation Groups will be led by a representative of a major government research user for each Node, such as one of the three management authorities (e.g. GBRMPA, TSRA, WTMA).

The Chair of each Implementation Group will:

- Be a representative of one of the leading research users; and
- Be endorsed by the NERP TE Hub Steering Committee and DSEWPaC.

The membership of the Implementation Groups will be determined and endorsed by the NERP TE Hub Steering Committee and comprise members as follows:

- The NERP TE Hub Science Leader;
- At least one representative from the NERP TE Hub Steering Committee;
- NERP TE Hub Program Leaders and Project Leaders in the relevant research Programs (identified in Attachment 1);
- At least one representative (separate from the Chair) from the Australian Government environment portfolio (DSEWPaC, GBRMPA, etc.);
- Members relevant to regional stakeholder interests (potentially including tourism, fisheries, agriculture, recreational fishing, commercial fishing, etc.);
- State and/or local government representatives; and
- Other representatives as determined by the NERP TE Steering Committee.

The **nominated representatives** for each of the four Implementation Group are provided in Attachment 2.

4. Procedures

The Implementation Group operates according to the following procedures:

- Meetings of the Implementation Group are to be convened by the Chair;
- The Implementation Groups will normally meet on a formal basis (including via teleconference) at least half yearly (see Table 1);
- At the request of the Implementation Groups, meetings may be convened more regularly;
- A quorum will be a simple majority of all members, including the Chair. Members should to the extent practicable make themselves available to attend meetings;
- In the absence of the Chair, the Chair may nominate another Group member (other than the Secretariat) to act as Chair for that meeting. If the Chair does not nominate an acting Chair, members present will elect an Implementation Group member (other than the Secretariat) to act as Chair;
- The RRRC will arrange for the members to be given notice of the agenda for any meeting and, if applicable, to provide the members with a copy of agenda items, at least five (5) business days before the meeting. Minutes of the Implementation Groups meetings will be recorded and distributed within seven (7) business days after each meeting. Records of each meetings must be approved by the Chair and Implementation Group members and kept by the RRRC;
- A member may add items to the agenda. Two (2) business days notice prior to the meeting would be appreciated;
- Business will be conducted by consensus. Where consensus is not possible, the Implementation Group will indicate in its report of meetings the number of members supporting a particular view and note all alternative views of members not supporting a recommendation;

- The Chair (with support from the RRRC) will write to the Steering Committee and, when required, the NERP TE Hub Science Leader and DSEWPaC, to advise on the outcomes of each meeting;
- The Implementation Group may invite observers or expert advisers as needed and on approval of the Chair; and
- As far as possible, proxy representation should be avoided. In the event that a proxy representation is unavoidable, then the proxy should be able to speak for the member or institution they represent. This is inclusive of Program and Project Leader representation. If a member requires a proxy for more than one meeting then it should be the same proxy that is used for those meetings.

5. Schedule of Meetings

The primary purpose and timing of each of the Implementation Group meetings for the NERP TE Hub are identified in Table 1.

Table 1. Primary Purpose and Timing of the NERP TE Hub Implementation Group meetings.

Year	Primary Purpose and Timing	
	Oct-Dec	**Mar-May**
Year 1 (2011/12)	- Researchers and research-users to agree on the products/outputs for each Project (as well as methods of engagement, research and knowledge transfer relevant to that project and related projects) covered by that Implementation Group. - Establish project and program linkages.	- Review progress towards project milestones. - Identify the 'pathway to adoption' for each Project covered by that Implementation Group in terms of products, approaches to engagement and timing. - Develop proposals for the Science Communication Competitive Fund. - Review project and program linkages. - Review upcoming research for AWP 2.
Year 2 (2012/13)	- Review progress towards project milestones. - Review progress towards the planned knowledge transfer, including communication products to date and opportunities for engagement. - Consider / review new proposals for the Science Communication Competitive Fund. - Review project and program linkages.	- Review progress towards project milestones. - Review progress towards the planned knowledge transfer, including communication products to date and opportunities for engagement. - Consider / review new proposals for the Science Communication Competitive Fund. - Review project and program linkages. - Review upcoming research for AWP 3.
Year 3 (2013/14)	- Review progress towards project milestones. - Review progress towards the planned knowledge transfer, including communication products to date and opportunities for engagement.	- Review progress towards project milestones. - Review progress towards the planned knowledge transfer, including communication products to date and opportunities for engagement.

Year	Primary Purpose and Timing	
	Oct-Dec	**Mar-May**
	- Consider / review new proposals for the Science Communication Competitive Fund. - Review project and program linkages.	- Develop final proposals for the Science Communication Competitive Fund. - Review project and program linkages. - Review upcoming research for AWP 4.
Year 4 (2014/15)	- Review the final reports from each project analyse the leanings from the conduct of each project. - Evaluate the impact of the outcomes of the research and the success of knowledge transfer processes.	

6. Disclosure of interests

All members are required to sign a Conflict of Interest Declaration on commencement and declare any conflicts of interest at each meeting, so that these are formally recorded in the records of the meeting.

7. Meeting, travel and accommodation arrangements

The RRRC will organise a venue for each meeting that provides the required amenities at optimal cost.

Implementation Group members will be expected to arrange their own accommodation as required. Members representing government agencies and/or NERP TE Hub research providers are expected to organise and bear the cost of attending meetings. Members that are not representing government agencies or research providers (e.g. industry and NGO representatives) may be reimbursed travel costs in accordance with the relevant Remuneration Tribunal Determination.

Other costs associated with activities undertaken by members for and on behalf of the Implementation Group may also be reimbursed provided prior agreement has been reached with the DSEWPaC. Claims for reimbursement should be made to the RRRC within two months of incurring the expense, and within the financial year in which the costs are incurred.

8. Resignation/Termination

An Implementation Group member may resign by giving a signed notice of resignation to the Chair.

Other than by resignation, termination or replacement of membership of the Implementation Group will be by the Chair in consultation with the NERP TE Steering Committee.

Appendix 6: Protocols

The following three protocols are designed to adhere to and complement the overarching NERP Communications Strategy and protocols developed by DSEWPaC[5].

Website content generation and uploading

NERP TE Hub Project Leaders and communications staff from stakeholder agencies will have the ability and be encouraged to generate website content based on NERP TE-funded activities, research outputs and publications.

The Hub Administrator will provide appropriate training and a procedures manual for the production and submission of website content. Content generated by NERP TE Hub researchers and other participants will be moderated and 'published' to the live WWW by the full-time web administrator. This step is not to control the way that NERP information is portrayed but to ensure consistency across the website and in any downloadable content available from the website.

A content writing protocol and website procedures manual will be provided for prospective authors.

The NERP TE Hub Intranet will be a password-accessible online space that provides researchers and communications staff with access to relevant logos, style guides (Aust. Govt and NERP guides), branded templates, and protocols relevant to NERP hub communications and publishing. The Intranet will also provide a secure area for housing of 'internal' documents, such as confidential reports, and workshop agendas and proceedings that are otherwise not for public viewing.

Access to the Intranet will be made available to all Hub Project Leaders and researchers, communications staff from stakeholder agencies, Hub administrator staff, and staff within the DSEWPaC Scientific and Information Division (NERP-specific staff). Access 'permissions' will vary depending on the role each person plays in the Hub.

Media

NERP TE media activities will occur in accordance with the overarching NERP Science Communication Strategy and protocols therein.

- Draft media releases arising from NERP TE Hub activities (research, workshops, conferences, etc.) will be initiated by uploading draft text to a secure section of the Hub website. Upload will trigger automatic notification by email of all subscribers who have indicated an interest in draft NERP TE media releases, including DSEWPaC and Science Leader.
- Hub participants could also upload notifications of impending media events that are not just media releases. For example, researchers giving presentations at conferences that might generate interest from the media.

[5] http://www.environment.gov.au/biodiversity/science/nerp/publications/index.html

- All media releases must include appropriate acknowledgements including the contributions of other partners, the support of NERP funding, and appropriate logos.
- Draft media releases, including revised versions, will remain visible to all for at least five working days prior to release to allow DSEWPaC time to respond to any issues raised by the release.
- Hub participants with any concern about the draft release will communicate with the Science Leader by the most efficient means (email, phone, etc.).
- A nil response after five working days will indicate implicit approval from the NERP Team of DSEWPaC.
- The Science Leader will approve the release at the earliest opportunity after the five working days, subject to the resolution of any concerns raised during the process.
- It is the responsibility of those creating media releases to upload draft and final text (if different). It is the responsibility of subscribers to make sure they are correctly subscribed and to respond quickly to the Science Leader if required. It is the responsibility of the Administrator to ensure that all media releases conform to NERP guidelines about credits and appearance. It is the responsibility of the Science Leader to ensure that this protocol is observed and to approve each press release.
- Research providers' and research users' communications units contributing relevant media monitoring on Hub funded research to submit regular (quarterly) summaries to the Science Leader and Administrator.

Editing for NERP TE publishing

It is intended that all NERP TE Hub publications will be published with an ISBN and lodged with the relevant national and state libraries in accordance with the Copyright Act 1968. The Administrator will be responsible for issue of ISBNs and library deposit. A NERP TE Hub technical report template will be made available to all Hub participants via the intranet section of the Hub website. The standard copyright clause and information about the NERP must be included in publications as provided in the report template.

Reports should be written clearly and succinctly, and follow the structure outlined in the report template. It is a requirement of authors to ensure that reports follow the set layout and styles as provided in the report template. Authors are also responsible for coordinating the peer-review and institutional approval to release their report prior to the report being submitted to the Hub Administrator for final online publication and delivery. The Administrator will be responsible only for preparing report cover artwork and ISBN administration.

Prior to submission of the peer-reviewed and institutionally approved document to the Hub Administrator, the author should ensure that:

- The document has been edited and checked for correct grammar and spelling;
- All cited literature is referenced appropriately;
- All figures and tables are numbered and captioned appropriately; and

- Appropriate acknowledgement of the Australian Government and other funding providers (if applicable) and contributors is included.

The Administrator will notify authors of issues relating to the finalisation of their report by email and work with them to publish their work.

The NERP encourages publication of research outputs in peer-reviewed, scholarly journals; open-access journals are preferred due to resultant accessibility of NERP TE-generated information beyond the academic world. Authors should ensure they are familiar with the required manuscript preparation requirements of the journal they wish to publish with.

The NERP TE Hub generally does not need to approve manuscripts prior to submission for journal publication. However, authors should provide advance notice of intended publication to the Science Leader and provide a copy of the published article as soon as possible to the Hub Administrator for archiving as part of the NERP TE Hub legacy.