



## Impacts and Achievements of the MTSRF

Copy of abstract and presentation given at the  
2010 Annual Conference of the  
Marine and Tropical Sciences Research Facility (MTSRF)  
[http://www.rrrc.org.au/news/2010\\_conference.html](http://www.rrrc.org.au/news/2010_conference.html)

Showcasing the Australian Government's investment  
in the MTSRF for improved sustainability of the  
North Queensland region, and Australia

18-20 May 2010  
Pullman Reef Hotel & Casino  
Cairns, North Queensland



### Abstract

#### [MTSRF Project Number 4.9.7c](#)

#### Identifying attributes of social resilience to enhance community capacity in the face of challenging water issues: a multi-site case study

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Through Project 4.9.7c, we have attempted to build a framework to identify and understand attributes of social resilience that influence local water quality and water conservation at the community scale within Great Barrier Reef catchments. We have done this by adopting a multi-site case study approach informed by four sub-projects including three PhD studies. One of the PhD researchers investigated the different ways that sustainability initiatives might foster resilience in school communities. Another explored barriers and benefits of water planning initiatives in relation to social resilience in Far North Queensland coastal communities, while the third PhD is concerned with encouraging residential water conservation in the coastal dry-tropics. The fourth sub-project investigated community perceptions of social resilience using interviews, workshops and surveys conducted in Townsville, and across the state. Through an analysis of reviewed literature and analysis of data collated from each of the four sub-projects, a social resilience framework was developed comprising five domains (ie people-place connections; knowledge, learning and skills; social networks; capacity building; planning and futures thinking; and economy). These domains and the corresponding indicators were corroborated with team members from James Cook University, University of Queensland and CSIRO. Working with the Great Barrier Reef Marine Park Authority, JCU researchers then piloted the indicators with staff from a variety of Reef Guardian Councils from Bundaberg through to Cairns. A major outcome of the research is a set of indicators which complement social data already collected by Council staff, and which can be used by Reef Guardian Councils to help inform decisions about where to prioritise resources and efforts in terms of community capacity to respond to challenging water issues.



**Australian Government**  
**Department of the Environment and Water Resources**



## Marine and Tropical Sciences Research Facility

# Developing community scale indicators of resilience to water quality changes

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**SOURCE: GBRMPA**





## **Acknowledgements**

**Project 4.9.7c Hilary Whitehouse, Snowy Evans, Renee Zielke**

**Project 4.9.7**

**Helen Ross, Kirsten MacLean, Michael Cuthill (UQ)**

**Tim Lynam, Erin Bohensky, Samantha Stone-Jovicech (CSIRO)**

**Project 1.2.1 James Butler, Leanne Cullen, Petina Pert**

**End users Allan Dale (Terrain) Chris Manning (TCC) Jason Vains  
(GBRMPA)**

**RRRC and MTSRF**





## Purpose

Identify strategies that help to 'operationalise' resilience thinking

## Guiding Question

Can managers work in ways that build community resilience while meeting their mandates?





# The crux of the matter.....





## Aims of 'resilience management'

- To be pro-active – ie to prevent a system from moving into an irreversible and/or undesirable state
- To nurture renewal and reorganisation after change

(Holling, Gunderson & Ludwig (2002))



## The Resilience Concept Package

<b>Resilience</b>	The capacity to bounce back after disturbance
<b>Adaptability</b>	What we can do in advance to help things return more or less to 'normal' after some disturbance
<b>Transformability</b>	The ability to create an essentially new system when circumstances demand this
<b>Scale</b>	It is important to consider influences from both above and below the system of interest



From Wolfenden, 2007





## Resilient communities

....ones that *predict* and *anticipate* change;  
*absorb*, *respond* and *recover* from shock  
or disaster; and *improvise* and *innovate*  
in response to disaster

(Aguirre, 2006 in Maguire and Hagan, 2007)



**Indicators** - describe and measure management objectives.

## Quantitative indicators

- measurable, comparable and recordable –
- often SMART – Specific, Measurable, Achievable, Relevant , Timed

## Qualitative indicators

- descriptive, providing a deeper, richer understanding
- sets of statements which *describe the characteristics* of a community (Tilbury et al., 2007).

**Focus of this research has been on qualitative indicators to describe characteristics of a resilient community**





At the community scale, three case studies were conducted:

## CASE STUDY 1

An urban water planning case study in Townsville to assess residents' capacity for stewardship of Townsville's waterways

( 22 in-depth interviews, 68 surveys and analysis of documents).

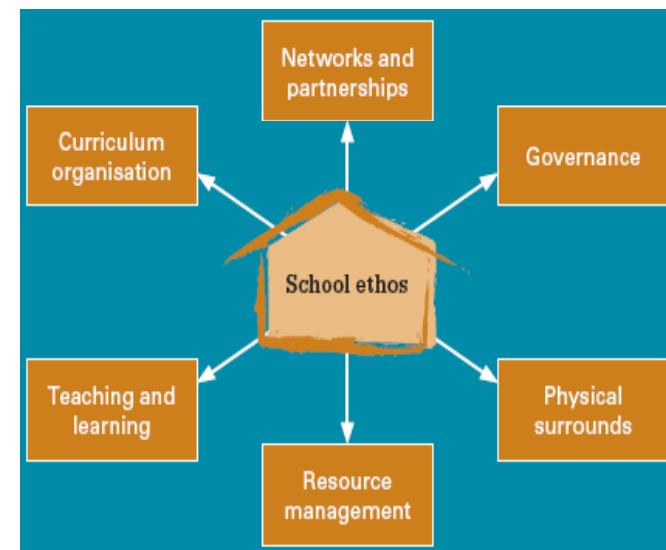
A PhD study associated with this case study is evaluating the effectiveness of community-based social marketing and collective social learning strategies for enhancing stewardship.



## CASE STUDY 2

Development of community resilience through sustainability initiatives in four Far North Queensland schools

(PhD study, using surveys of teachers; document analysis; workshops; and 23 in-depth interviews of principals, teachers and students).





## CASE STUDY 3

Barriers and benefits associated with the implementation of Water Quality Improvement Plans in Far North Queensland

(PhD study, with 22 in-depth interviews, document analysis and workshops).





**Table 1: Twenty variables that influence how communities might manage for resilience in the face of changing water quality**

Resilience	Adaptability	Transformability
1.1. Agency willingness to enforce regulations	2.1. Large networks and communication	3.1. Networks beyond usual groups
1.2. Turnover of NRM agency staff	2.2. Community capacity to be involved in water quality issues	3.2. Receptiveness of regulatory & NRM staff to community concerns
1.3. Clarity of vision of NRM agencies		3.3. New cross-scale community-government partnerships
1.4. Industry adherence to best management practice		3.4. Champions and leaders
1.5. Number of stewardship volunteers		3.5. Media coverage of water quality issues
1.6. Extent of housing, mining, agriculture, fishing, tourism		3.6. Enforcement of building regulations by agencies
1.7. Costs of waterway restoration		3.7. Extent of community restoration of waterways
1.8. Viability of tourism, fisheries, agriculture, mining		3.8. Number of water quality monitors
1.9. Community visions & aspirations		
1.10. Community health and well-being		





## **Variables were grouped under 7 major attributes (themes) that emerged from the data:**

People-place connections

NRM knowledge, learning & skills

Social networks

Capacity to plan for the future

Engaged governance

Diverse & innovative economy

Community infrastructure & services





## People-place connections

Integrated and holistic approaches to building resilient and sustainable communities that acknowledge human-environment interdependencies and connections

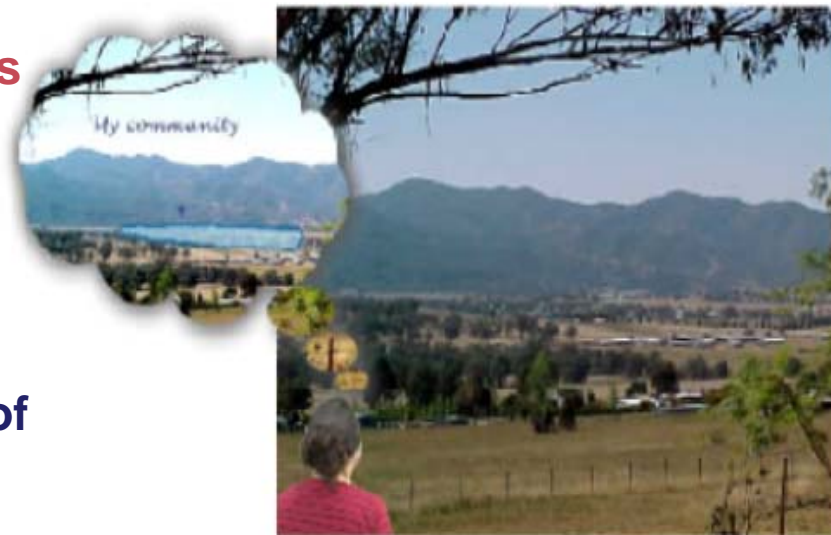
**1.5. Number of stewardship volunteers**

**1.9. Community visions & aspirations**

**1.10. Community health & well-being**

**3.7. Extent of community restoration of waterways**

**3.8. Number of water quality monitors**



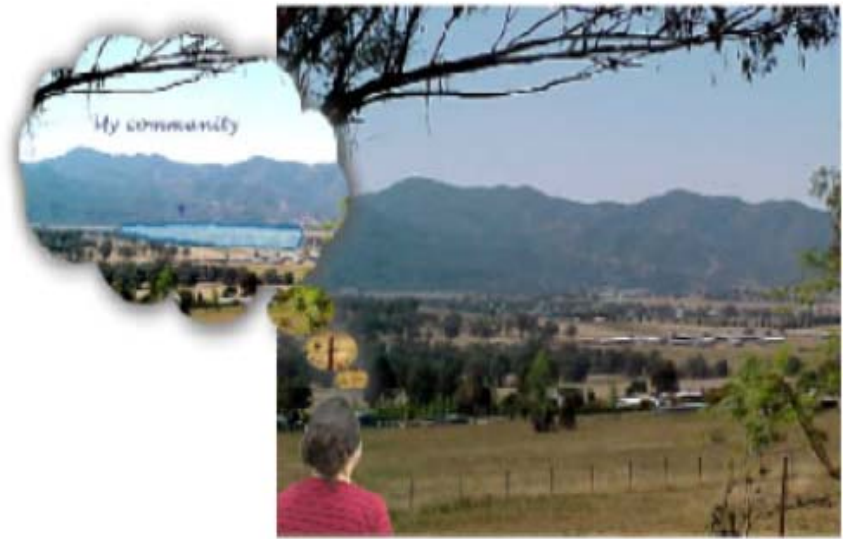


## NRM knowledge, learning & skills

Individual and group capacity to respond to local needs and issues, improving knowledge.

### 2.2. Community capacity to be involved

### 3.5. Media coverage of issues



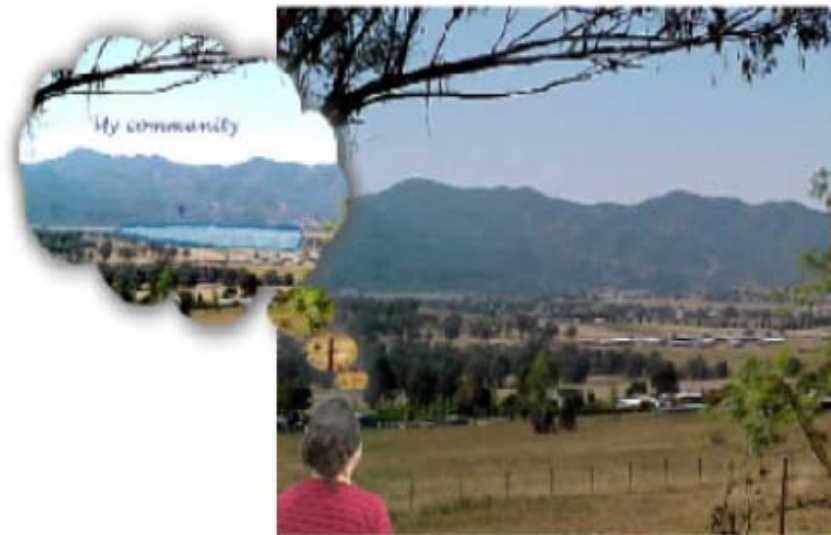


## Social networks

Processes and activities that build and support people and groups in a place.

### 2.1. Large networks and communication

### 3.1. Networks beyond usual groups





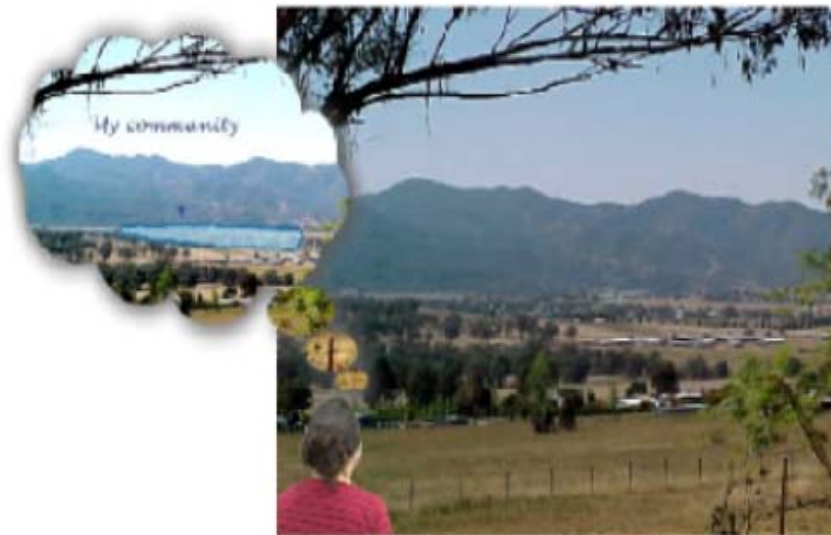
## Capacity to plan for the future

Individual and group capacity to develop a shared vision for the future of their community that is ecologically sustainable, economically viable and culturally diverse.

**1.9. Community visions & aspirations**

**2.2. Community capacity to be involved in water quality issues**

**3.4. Champions and leaders**



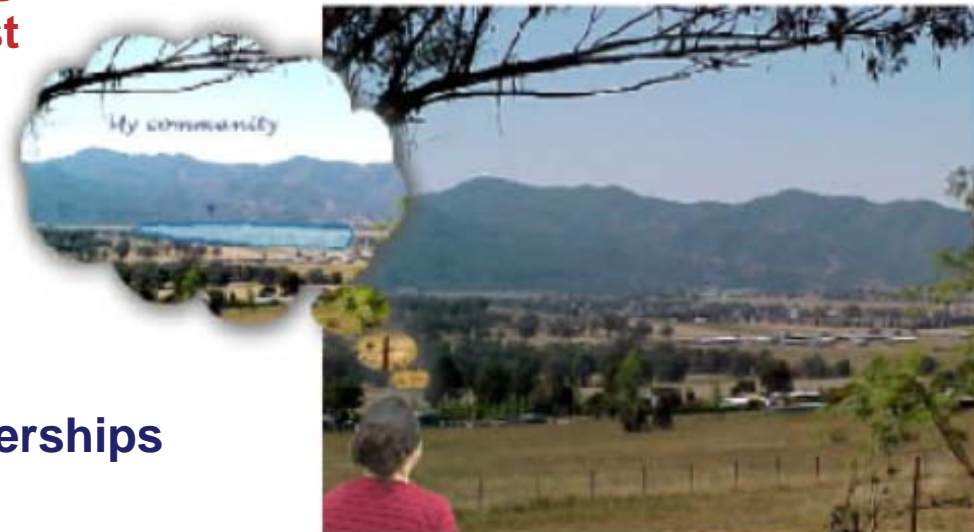


## Engaged governance

Collaborative processes for regional decision making (includes partnerships, planning, supportive and creative institutions).

- 1.1. Agency willingness to enforce regulations
- 1.2. Turnover of NRM agency staff
- 1.3. Clarity of vision of NRM agencies
- 1.4. Industry adherence to best management practice

- 3.2 Receptiveness of regulatory & NRM staff to community concerns
- 3.3. New cross-scale community-government partnerships
- 3.6. Enforcement of building regulations by agencies





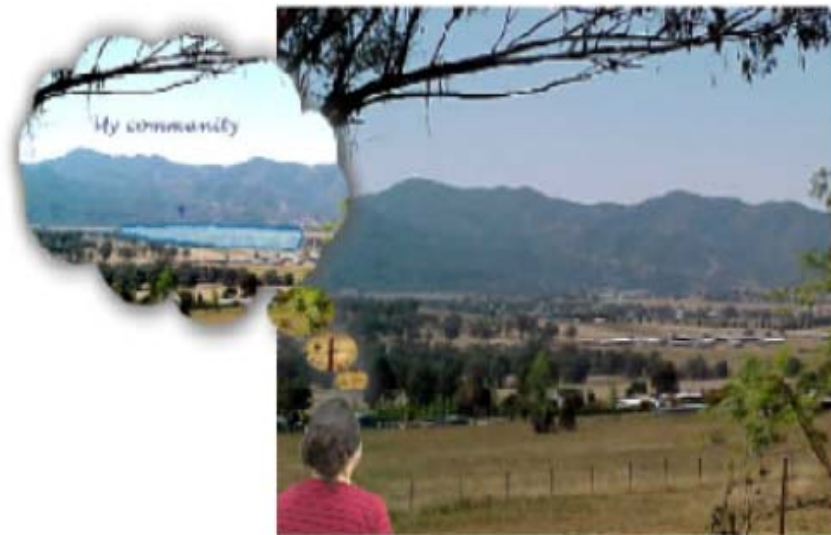
## Diverse & innovative economy

Regional economy comprises a good selection of industry and services, and supports new and exciting opportunities.

**1.7. Costs of waterway restoration**

**1.8. Viability of tourism, fisheries, agriculture, mining**

**1.10. Community health and well-being**





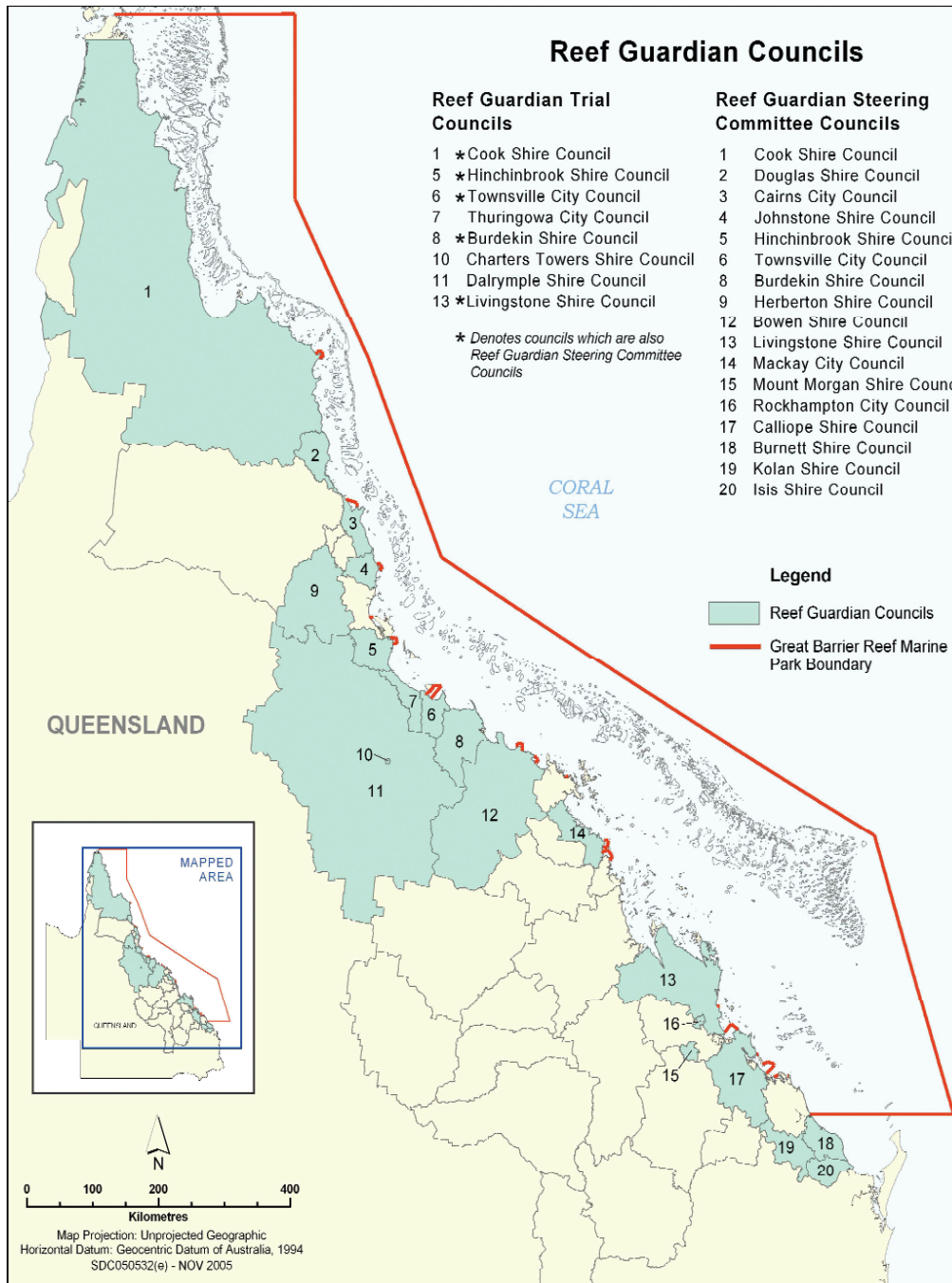
## Community infrastructure and services

Appropriate services and facilities to support identified community needs.

**1.6. Extent of housing, mining, agriculture, fishing, tourism**

**1.10. Community health and well-being**



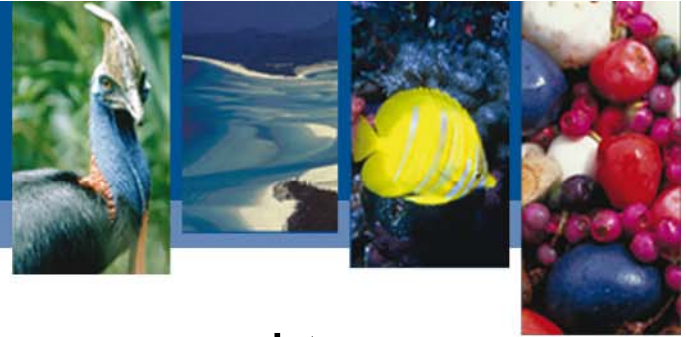


**Next .....**

**With Reef Guardian Councils, trialed a set of questions grouped under each broad attribute to see if they could be used to to show management priorities within a resilience framework.**

**Benefit of the exercise is in asking staff to allocate a collective rating for each question, then discussing why...ie allocating some evidence or justification for their responses.**

# Marine and Tropical Sciences Research Facility



Thanks again to colleagues and end users and to  
RRRC and MTSRF for funding the research

