

NERP Tropical Ecosystems Hub – Project 10.2

Socio-economic systems and reef resilience

Project Leader: Prof Dr Natalie Stoeckl

James Cook University School of Business and The Cairns Institute

Overview

Aims: To learn more about what the economy does to the GBRWHA and what the GBRWHA does to people

Methods:

We collected data from **more than 1,500 residents** of the GBR catchment area (covering more than 100 postcodes); and from **more than 2,500 visitors** (over 12 months, between Yeppoon and Port Douglas, using Chinese, Japanese and English questionnaires). This data has (and is) being analysed in numerous different ways.

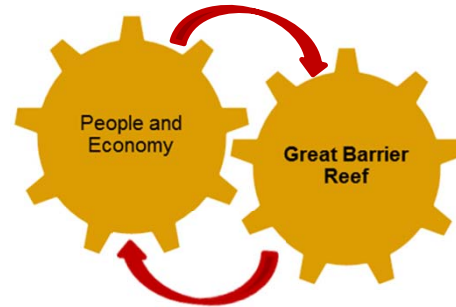
We also collated **data from the 1930s through to current times** about beef prices, wages, cattle numbers, rainfall and sediment loads in the Burdekin catchment, exploring the relationship between them.

A truly dynamic interlinked system:

Changes in the economy affect the environment.

These changes feed back and affect people and economy

Changes in the economy can have negative impacts on the environment (e.g. link between higher cattle prices and sediment)



The environment is important to people: Deterioration of the GBRWHA thus has a real impact on the economy (e.g. increases in turbidity lead to decreases in tourist satisfaction and thus impacts the tourism industry).

What the economy does to the GBRWHA

- Rainfall and extreme events have a significant impact on sediment loads, but after controlling for those, we established that beef prices also play an important role. Increases in beef prices encourage graziers to increase cattle numbers, and that subsequently increases sediment loads.
- There is evidence to suggest that landowners are becoming more sensitive to prices over time.
- The Burdekin dam acts as a type of sediment trap: nowadays, rainfall generates less sediment at the mouth of the river than before the dam was constructed.

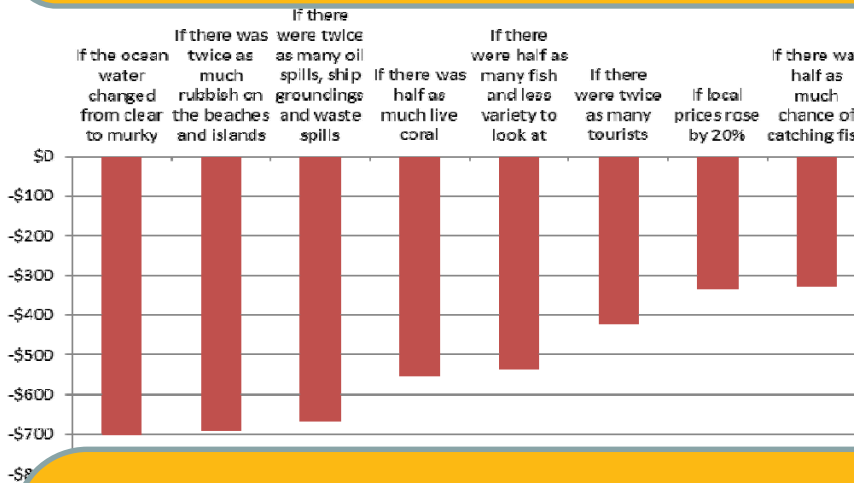


Figure 1. Potential impacts on tourism revenues in the face of hypothetical changes to the GBR: current per-person per-visit expenditures compared to projections

Current expenditure per visitor could decrease by more than \$600 as a result of changes in environmental conditions of the reef, potentially translating into a 50% drop in revenues to the tourism industry

Importance of the GBRWHA to tourists and the tourism industry

- The average visitor spends \$1,130 in the GBRWHA region, \$142 a day.
- The most important regional 'draw-cards' relate to the marine environment – clear oceans, healthy reefs and healthy fish.
- The strongest potential deterrents (things which would make visitors shorten their visits or not come at all) included the prospect of oil and waste spills, murky ocean water and rubbish.
- On average, visitors are willing to contribute up to \$15 per person per visit to reduce various threats to the GBRWHA: \$14 for improvements in water quality; \$16 for decrease in shipping accidents and associated pollution; and \$9 for conservation of large predators
- Tourist satisfaction levels are lower in regions with high ocean turbidity (controlling for other factors)
- Deterioration of the GBRWHA could have a substantive financial impact on tourism industry, potentially translating to 50% drop in per visitor revenues

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Importance of the GBRWHA to catchment residents

- Residents feel that nature unpolluted by rubbish, healthy reef fish, healthy coral reefs, and healthy mangroves and wetlands that clean polluted water from the land are more important to their overall quality of life than the jobs and incomes associated with key regional industries.
- Residents are not very satisfied with the current condition of these things.
- The top-five items on a list of pertinent management interventions along the GBRWHA are:
 - Beaches and islands without visible rubbish (bottles, plastic);
 - Preserving the GBRWHA either for its own sake or for future generations;
 - Healthy habitats for marine species including iconic species such as whales, dugongs and turtles;
 - Healthy coral reefs; and
 - Healthy reef fish.
- Residents are most concerned by the prospect of oil and waste spills, rubbish and murky ocean water.
- They reacted to hypothetical changes in these things more negatively than to hypothetical increases in prices.
- There are financial feedbacks here too: the more dissatisfied people become with the region, the harder it may be to encourage people to come to or remain in the region (e.g. for work).
- On average, residents are willing to pay \$32 for improvements in water quality; \$30 for conservation of top predators; and \$28 for decrease in shipping and associated pollution, per household per annum.
- Older, less educated residents and those born in Queensland were willing to pay less than other residents to protect the natural environment.
- Absolute willingness to pay (WTP) increases with income; however, relative WTP (as a percentage of household income people were WTP to protect environment) is highest in the low income groups.
- Based on current value of tourism and importance of non-market values, the whole of ecosystem might be worth more than \$20b per annum (possibly up to \$400 billion in perpetuity).

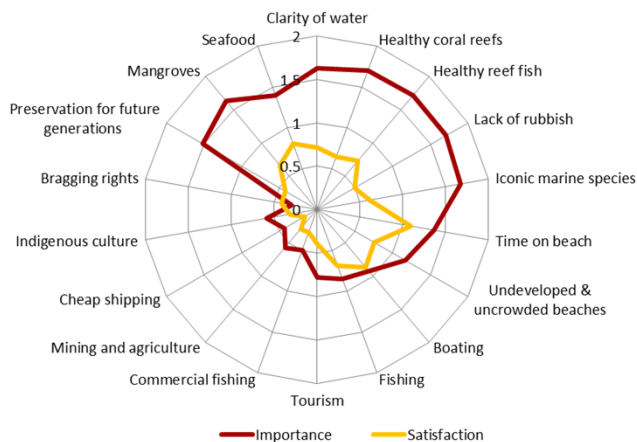


Figure 2. Importance of and satisfaction with services related to GBRWHA (resident perceptions)

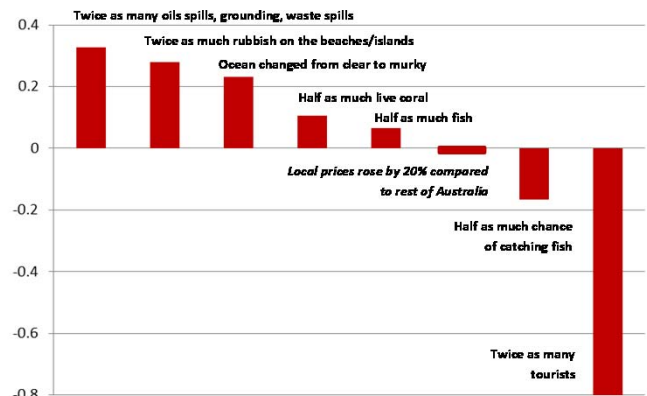


Figure 3. Stated changes in satisfaction that would result from an environmental change, compared to an increase in local prices (at 0): change shown as above 0 affect people more negatively than a 20% increase in local prices

Recreational fishing and boating

- There has been a decline in fishing participation: new migrants don't fish as often as those who have lived in the area long time.
- An aging population may decrease boat-fishing participation: people seem to switch to land-based fishing as they age.
- Not many people practise 'catch and release' in this region.
- A fishing trip is not only about 'fish' but also about the fishing experience: the value of fish caught is only about one third of cost of the average fishing trip (\$7-\$22 compared to \$63).
- Fishing is not an important activity to tourists.

Find this project at www.nerptropical.edu.au
 Theme 3: Managing for resilient tropical ecosystems
 Program 10: Socio-economic value of GBR goods and services
 Project: 10.2 Socio-economic systems and reef resilience

For more information, copies of this fact-sheet or a Technical Report with more details, please contact:
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