Measuring regional well-being
Options and challenges
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GDP is NOT a good measure of well-being

Life Satisfaction and Per Capita GDP around the World

Source: Penn World Tables 6.2
Note: Each circle is a country, with diameter proportional to population. GDP per capita in 2005 is measured in purchasing power parity chained dollars at 2010 prices.

See: http://filispagnoli.files.wordpress.com/2008/09/happiness-and-income-cross-country.png
"Empty World" Model of the Economy

Basic premises:
- More is always better
- The economy can grow forever
- Private property is always best


"Full World" Model of the Ecological Economic System

Materially closed earth system

### Key point: Well-being is about far more than just money

- **Key challenges:**
  - Working out what one should include (although there is general agreement about needing a range of different measures)
  - Ensuring one can find good quality data
    - Across countries, regions, communities or people?
    - Across time?
  - Working out how to present the information
    - As one, combined ‘indicator’ that hopes to capture all?
    - As a list of variables?
    - As a weighted list of variables?

### Some examples

- Genuine Progress Indicators (global and national scale)
- State of the Tropics project (transnational and national scale)
- Northern Profiling project (regional scale)
- What is the good life (community scale)
- Northern Australian investigations into the relative importance of factors to overall quality of life, and people’s satisfaction with those factors (individual scale)
Genuine Progress Indicator
(global and national scale)

**Genuine Progress Indicator (or ISEW) by Column**

**Additions**
- Column A: Personal Consumption Expenditures
- Column B: Income Distribution
- Column C: Personal Consumption Adjusted for Income Inequality
- Column D: Value of Household Labor
- Column E: Value of Volunteer Work
- Column F: Services of Household Capital
- Column G: Services Highways and Street
- Column H: Cost of Crime
- Column I: Cost of Family Breakdown
- Column J: Loss of Leisure Time
- Column K: Cost of Underemployment
- Column L: Cost of Consumer Durables
- Column M: Cost of Commuting
- Column N: Cost of Household Pollution Abatement
- Column O: Cost of Automobile Accidents
- Column P: Cost of Water Pollution
- Column Q: Cost of Air Pollution
- Column R: Cost of Noise Pollution
- Column S: Loss of Wetlands
- Column T: Loss of Farmland
- Column U: Depletion of Nonrenewable Resources
- Column V: Long-Term Environmental Damage
- Column W: Cost of Ozone Depletion
- Column X: Loss of Forest Cover
- Column Y: Net Capital Investment
- Column Z: Net Foreign Lending and Borrowing

**Subtractions**

- Built Capital
- Human Capital
- Social Capital
- Natural Capital
Genuine progress versus GDP - global

Genuine Progress Indicator

Fig. 4. GPI/capita. The GPI/capita for all 37 countries used in this Estimates are from various sources noted in the text. All data are in 2005 US$. 

State of the Tropics Project
(Transnational and national scale)

www.stateofthetropics.org
Is life in the Tropics getting better?

The Project

- **Global and collaborative**: 12 institutions
- **The Tropics**: 109 nations
- **Rest of the World**: 107 nations, as counterpoint
- **Eight regions**: (Central & Southern Africa; Northern Africa & Middle East; South Asia; South East Asia; Caribbean; Central America; South America; Oceania)
- **Eight ‘straddling’ nations**: split out Tropics/ non-Tropics
- **∼50 indicators**: limited by data availability; output indicators
- **Data sources**: World Bank, IMF, United Nations, UNESCO, UNICEF, FAO, IUCN, WHO etc
- **Analysis**: descriptive; high level, longer term regional trends (not looking ‘inside’ nations)
- **Context**: Tropical Australia 0.04% of Tropics’ population
Is life in the Tropics getting better?

Yes, no, maybe....

Compared with the Rest of the World:

- Life expectancy is lower & more people live in poverty
- Disease burden is higher
- Crime and corruption is higher
- GDP per capita is lower & public debt is higher
- Environmental degradation is occurring at a faster rate
- Losing primary forests, corals reefs and mangrove forests

BUT ... ...

- Significant progress on many social indicators over past 50 years
- Considerable regional variation
- Challenge is to improve living standards ‘responsibly’

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The Ecosystem

<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicator</th>
<th>Getting better?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmosphere</td>
<td>CO₂ emissions</td>
<td>Increasing ✗</td>
</tr>
<tr>
<td></td>
<td>Electricity generation</td>
<td>Increasing but so is renewable energy generation ✓</td>
</tr>
<tr>
<td></td>
<td>Air pollution</td>
<td>PM₁₀ decreasing ✓</td>
</tr>
<tr>
<td>Land and Water</td>
<td>Land degradation</td>
<td>Increasing ✗</td>
</tr>
<tr>
<td></td>
<td>Agricultural land</td>
<td>Increasing ✗ but so is productivity ✓</td>
</tr>
<tr>
<td></td>
<td>Renewable water resources</td>
<td>No time series</td>
</tr>
<tr>
<td>Oceans</td>
<td>Fish production – wild marine catch</td>
<td>Stabilising after rapid increases ✓</td>
</tr>
<tr>
<td></td>
<td>Fish production – aquaculture</td>
<td>Increasing ✓</td>
</tr>
<tr>
<td></td>
<td>Coral reefs</td>
<td>Declining ✗</td>
</tr>
<tr>
<td></td>
<td>Mangroves</td>
<td>Declining ✗</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Biodiversity and threatened species</td>
<td>Declining ✗</td>
</tr>
<tr>
<td></td>
<td>Protected areas</td>
<td>Increasing ✓</td>
</tr>
<tr>
<td></td>
<td>Extent of primary forests</td>
<td>Declining ✗</td>
</tr>
</tbody>
</table>
### The Human System - Society

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>Population living on less than $1.25 per day</td>
<td>Decreasing</td>
</tr>
<tr>
<td></td>
<td>Undernourished population</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>Urban population</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Slum population</td>
<td>No time series – more slums in the Tropics than Rest of the World</td>
</tr>
<tr>
<td>Health</td>
<td>Life expectancy</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Maternal and child mortality</td>
<td>Decreasing</td>
</tr>
<tr>
<td></td>
<td>Obesity and non-communicable diseases</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>HIV and AIDS</td>
<td>Prevalence has increased but death rate declining</td>
</tr>
<tr>
<td></td>
<td>Tuberculosis</td>
<td>Declining (except PNG)</td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>No time series – disease burden much higher in the Tropics</td>
</tr>
<tr>
<td></td>
<td>Dengue and neglected tropical diseases</td>
<td>No time series and unreliable data – disease burden much higher in the Tropics</td>
</tr>
<tr>
<td>Education</td>
<td>Mean years of schooling of adults</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Child and adult literacy</td>
<td>Increasing</td>
</tr>
<tr>
<td>Work</td>
<td>Unemployment</td>
<td>Decreasing overall but variable</td>
</tr>
</tbody>
</table>

### The Human System - Economy

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Output</td>
<td>GDP per capita</td>
<td>Increasing</td>
</tr>
<tr>
<td>International trade and investment</td>
<td>Exports of goods and services</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Imports of goods and services</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Foreign direct investment, net inflows</td>
<td>Increasing</td>
</tr>
<tr>
<td>Science and technology</td>
<td>Research and development expenditure</td>
<td>Increasing (poor data coverage)</td>
</tr>
<tr>
<td></td>
<td>Enrollment in higher education</td>
<td>Increasing</td>
</tr>
<tr>
<td></td>
<td>Scientific and technical journal articles</td>
<td>Increasing</td>
</tr>
<tr>
<td>Government</td>
<td>Public sector debt service burden</td>
<td>Decreasing but highly variable</td>
</tr>
</tbody>
</table>
## The Human System - Governance

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human security</td>
<td>Refugees</td>
<td>Decreasing but highly variable – updated data required</td>
</tr>
<tr>
<td>Crime and corruption</td>
<td>Homicide rate</td>
<td>No time series but rate much higher in the Tropics ☒</td>
</tr>
<tr>
<td></td>
<td>Corruption</td>
<td>No time series but more prevalent in the Tropics ☒</td>
</tr>
<tr>
<td>Gender equality</td>
<td>Ratio female to male with secondary education</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td></td>
<td>Women in national parliament</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Gross capital formation</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td></td>
<td>Access to improved water</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td></td>
<td>Access to improved sanitation</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td>Communication</td>
<td>Mobile phone subscriptions</td>
<td>Increasing ☑</td>
</tr>
<tr>
<td></td>
<td>Internet users and broadband subscriptions</td>
<td>Increasing ☑</td>
</tr>
</tbody>
</table>

### Northern Profiling Project

*(regional scale)*

Conceptual model for socioeconomic profiling (the ‘wish list’)

- Demographic characteristics
- Numbers and actions
- Settlement patterns & mobility
- Household organisation
- Employment
- Labour
- Business
- Investment
- Regional sectors
- Transportation infrastructure
- Housing infrastructure
- Health services
- Utility services
- Community services
- Recreational and other services
- Land tenure
- Access to NR
- Local/regional government
- Community organisation
- NGOs & religious groups
- Social cohesion
- Education levels
- School retention rates
- Health status
- Social life
- SDIFAs
- Water supply and use
- Agricultural productivity
- Natural resources
- Pollution and water disposal
- Environmental risks
- Anthropological
- Cultural, sacred
- and amenity sites
- Heritage sites
- National parks & other protected areas
- Higher
- Title/tenure
- Economic values of water
- Societal values of water
- Attitudes and perceptions of water
Data used for profiling

- Demographic Characteristics
  - Population, People, Age
  - Mobility, Population Change
- Economic Parameters
  - Unemployment, Income
  - Industry of Employment
  - Number of Businesses
  - Number of Mines
- Individual Wellbeing
  - Family Income + loan payments
  - Household size + One-parent families
  - Women with >3 children
  - % pop with no school
  - % pop with <= year ten schooling
  - % population with no religion
  - % houses only speaking English
- Infrastructure and Services
  - Roads, Airports, Schools
  - Internet connections,
  - Persons per bedroom
  - Housing tenure, vehicle access
  - Remoteness Index
- Institutional Arrangements
  - Number of registered community organisations
  - Volunteering
- Environment and Culture
  - No of major dams, Outflow
  - Availability of perennial water
  - Soil quality, Land use
  - Cyclone risk
  - Number of registered cultural sites

Key messages from the profiling activities

- Data difficulties abound
- Urban and Rural areas differ demographically and socio-economically
- Also significant differences between and within rural areas
  - Biophysical
  - Cultural
  - Opportunities for development (mining, agriculture, tourism)
  - Infrastructure (hard and soft)
  - Human, social & institutional capital
- Some catchments are socioeconomically ‘similar’ in many ways but catchments are not always clustering within the same ‘group’.
  - Indicates complexity, that needs further investigation.

Figure 3. Clusters of similar and different catchments in the Tropical Rivers region of northern Australia (the same shading indicates the same cluster membership).

“What is the good life?” Project (regional scale)
What is a good life?

Understanding Community Wellbeing in Tropical Regions

Project leader: Prof Gianna Moscardo
Cairns Institute, School of Business James Cook University

What the program is about

• Measuring and understanding community well-being in tropical regions.

• Critically evaluating the impacts of particular forms of development on community well-being:
  – Support for small/micro business
  – Types and patterns of tourism development
  – Issues related to work-life balance
  – Markets for local food
Why do we need this program?

- Existing discussion is too narrowly focused on aspects of finance and wealth
- Existing systems at the national and state level don’t provide sufficient, reliable detail for regions
- Existing systems have been designed mostly within northern hemisphere, urban, affluent, developed, temperate, contexts
- There are regional/tropical dimensions that don’t get covered in existing systems
  - Frequency and types of natural disasters
  - Problems of population dispersal/distance
  - Managing diverse cultural/ethnic groups within regions

Living in/around and with important & protected ecosystems

What the program includes

- Investigations into what matters for community well-being in Australian tropical regions
- The development and trial of a Tropical Regional Community Well-being Indicator System
- More detailed examination of specific issues
What Matters for Community Well-being in the Tropics

- Analyzed existing data from various regional planning exercises,
- Added to that using interviews with key informants and additional resident surveys and stakeholder workshops
- Reviewed research and indicator systems used in other Tropical places
  - Includes the larger JCU State of the Tropics exercise

The Trial Indicator System

- Describe the ideal system (the blank cheque version)
  - Objective measures (information of services and community characteristics)
  - Subjective measures (what residents and other stakeholders feel and believe)
- Create profiles for several regions in Tropical North Queensland using existing objective data and seek stakeholder feedback on those
  - Plan to have these available late 2013
- Connect the system to others to ensure efficiency and ability to make comparisons
  - Commenced building links to Community Indicators QLD, Community Indicators Victoria, the Australian Community Indicators Network, the Australian National Unity Index, and Australian National Development Index
  - Mindful of the State of the Tropics and the measures of Australian Progress
Northern Australian investigations into the relative importance of factors to overall quality of life (individual scale)

The importance of different factors to overall quality of life in Northern Australia

• Results from studies funded by
  – The Northern Australia Water Futures Assessment
  – The National Environmental Research Program

• Overview of study currently underway in wet tropics world heritage area

• Overview of studies being undertaken by PhD students

• Why relevant to other ‘indicator’ studies?
  – Helps prioritise long lists of ‘indicators’, identifying those which residents think most/least important
The importance of the socio-cultural ‘values’ associated with Australia’s tropical rivers, compared to other ‘values’.

Larson’s ‘Index of dis-satisfaction’

<table>
<thead>
<tr>
<th>Rivers for</th>
<th>Mean 1</th>
<th>Mean 2</th>
<th>% selecting</th>
<th>IDI</th>
<th>Reasons for dissatisfaction (concerns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial purposes?</td>
<td>78</td>
<td>70</td>
<td>95</td>
<td>22</td>
<td>Pollution (from mining)</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>Overuse by tourism, irrigation, commercial, domestic</td>
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<td></td>
<td>Need for better monitoring</td>
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<td></td>
<td>Cost of water and uncertainty about future access</td>
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<td></td>
<td>Need for capture and storage (silt dams) and for improved water supply</td>
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<td></td>
<td></td>
<td></td>
<td>Poor water quality (Chlorine)</td>
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<td></td>
<td>Boundaries and regulations/Government restrictions</td>
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<tr>
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<td></td>
<td>Uncertainty of use (many homes/cattle watering points, exports to Perth, etc)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Need for capture and storage (storm run-off water)</td>
</tr>
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<td></td>
<td>Need to improve environment around rivers, more trees</td>
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<td></td>
<td></td>
<td>Concern for the future - water is not looked after</td>
</tr>
<tr>
<td>Human Life?</td>
<td>93</td>
<td>79</td>
<td>98</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Other Life?</td>
<td>95</td>
<td>81</td>
<td>97</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Fishing?</td>
<td>72</td>
<td>70</td>
<td>95</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Recreation?</td>
<td>78</td>
<td>78</td>
<td>89</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Teaching?</td>
<td>66</td>
<td>72</td>
<td>80</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Aesthetics?</td>
<td>81</td>
<td>79</td>
<td>91</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Existence?</td>
<td>80</td>
<td>78</td>
<td>73</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

These mean values do not exactly coincide with those presented in Fig. 2 because they only include data from respondents who answered both the importance and dissatisfaction questions relating to each factor.

This comment most likely explains why some people do not use the rivers for recreational purposes but instead simply enjoy them for their ‘existence’ value.

### Residents

How important are each of the following to your overall quality of life? (N=1001)

<table>
<thead>
<tr>
<th>Importance Level</th>
<th>No visible rubbish</th>
<th>Healthy reef fish</th>
<th>Healthy coral reefs</th>
<th>Iconic marine species</th>
<th>Mangroves and wetlands</th>
<th>Clear oceans</th>
<th>Preserving the GBRWHA</th>
<th>Eating seafood</th>
<th>Time on beaches</th>
<th>Undeveloped and uncrowded beaches</th>
<th>Boating</th>
<th>Fishing and crabbing</th>
<th>Tourism industry</th>
<th>Indigenous Culture</th>
<th>Mining and Agricultural industries</th>
<th>Commercial Fishing industry</th>
<th>Cheap shipping</th>
<th>Bragging rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Important</td>
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<tr>
<td>Neutral</td>
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<tr>
<td>Unimportant</td>
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</tr>
</tbody>
</table>

### Connections between Resident ‘Values’

**Indicative Conceptualisation Only**

- **Overall quality of life**
  - **No visible rubbish**
  - **Seafood**
  - **Beach-time**
  - **Boating**
  - **Fishing**
  - **reef-based tourism**
  - **commercial fishing**
  - **Indigenous cultural values**
  - **mining and agriculture**
  - **cheap shipping transport**
  - **Coral reefs**
  - **Reef Fish**
  - **Iconic Marine Species**
  - **Clear Oceans**
  - **Healthy Mangroves and wetlands**

15/08/2013
HOW WOULD EACH OF THE FOLLOWING AFFECT YOUR OVERALL QUALITY OF LIFE ......
**Tourists**

**How important were each of the following as a reason for coming to this part of Australia? (N = 2455)**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Unimportant</th>
<th>Neutral</th>
<th>Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear oceans</td>
<td>20%</td>
<td>15%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Healthy coral reefs</td>
<td>10%</td>
<td>20%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Healthy reef fish</td>
<td>10%</td>
<td>25%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>No visible rubbish</td>
<td>10%</td>
<td>20%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Sunshine and warmth</td>
<td>20%</td>
<td>25%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Iconic marine species</td>
<td>5%</td>
<td>10%</td>
<td>30%</td>
<td>55%</td>
</tr>
<tr>
<td>Time on beaches</td>
<td>20%</td>
<td>20%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Wet tropics</td>
<td>15%</td>
<td>25%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Iconic land animals</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>35%</td>
</tr>
<tr>
<td>Undeveloped and uncrowded beaches</td>
<td>5%</td>
<td>15%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Quality accommodation</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Mangroves and wetlands</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Price matches budget</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Eating seafood</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Bragging rights</td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
<td>55%</td>
</tr>
<tr>
<td>Boating</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Indigenous Culture</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Visiting friends</td>
<td>20%</td>
<td>25%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Fishing and crabbing</td>
<td>10%</td>
<td>20%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Not travelling far</td>
<td>10%</td>
<td>20%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Business</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Tourists: How would each of the following have affected your decision to come to this part of Australia?**

- Twice as many oil spills, groundings and waste spills
- Ocean changed from clear to murky
- Twice as much rubbish on the beaches and islands
- Half as much live coral
- Local prices rise by 20% compared to other places in Australia
- Half as many fish and less variety of fish to look at
- Twice as many tourists
- Half as much chance of catching fish

Options:
- I may have stayed for longer
- It would not have affected by decision
- I would have reduced by stay by 25%
- I would have reduced by stay by 50%
- I would have reduced by stay by 75%
- I would not have come at all
Current project
TE NERP 12.3 – collecting data from residents of and tourists to the Wet Tropics World Heritage area
Note the addition of social/community questions (compared to GBR study, focusing only on economy and environment)

Cardinal indicators of Utility / Life satisfaction

\[ LS = f(\text{environment, income, age, gender, etc}) \]

Have several PhD students who are
1) conducting surveys where they ask about
   - Overall life satisfaction
   - Income, age, gender, etc.
2) Collecting other ‘external’ data about state of the environment, etc
3) Planning to estimate these life-satisfaction equations, to determine how much each of these factors contributes to overall quality of life

Studies in
- The Philippines (with particular focus on impact of flooding)
- China (with particular focus on impact of coal mining)
- Northern Australia and Costa Rica (with particular focus on impact of biodiversity)
Concluding comments

- Important to look at more than just money
- Different people are likely to think that different things are important, so may need to consider ways of allowing for that
  http://www.oecdbetterlifeindex.org/
- Data likely to be a limiting factor in some cases, in other cases may have too many indicators, the core problem being WHICH ones to select.