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# Scenarios for the Great Barrier Reef catchment: Learning from the future

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# Outline

- **The Great Barrier Reef catchment: location and facts**
- **Rationale for the research and project goals**
- **Why scenario planning?**
- **Scenario building method**
- **Key drivers of change and uncertainties**
- **Draft scenarios for the Great Barrier Reef catchment in 2050**
- **Potential uses and values of the scenarios**

# The Great Barrier Reef (GBR) catchment – location

- Extends 2300 km along the north-east coast of Queensland
- Catchment area covers about 22% of Queensland's land area (425,964 km<sup>2</sup>)
- The adjacent GBR lagoon covers an area of approximately 350,000 km<sup>2</sup> on the north-eastern Australian continental shelf



# The GBR catchment – diverse land- and seascapes

- Includes wet tropical lowlands and uplands, tropical savannahs and desert uplands
- Main land uses – nature conservation, cattle grazing, sugarcane cultivation, cropping, horticulture and mining
- Land based activities account for about 30% of the Gross State Product and about 60% of exports
- 2,900 individual reefs
- The GBR was listed as World Heritage Area in 1981
- World's largest marine protected area (multiple-use park)
- Economic value of the GBR for marine tourism, commercial fishing and recreational use is now estimated at \$ 1 billion annually with flow-on effects on the regional economy



# Rationale for the research

- **Key issues:**

- Many of the terrestrial and aquatic uses of the GBR catchment conflict with each other and with the protection of the values of the GBR World Heritage Area
- Changes in land use and management have increased significantly since European settlement:
  - increased pollutants in rivers draining into the GBR lagoon
  - decline in water quality poses a significant threat to the Reef

- **Challenges:**

- Implementation of the Reef Water Quality Protection Plan (Reef Plan) – joint Federal and State Government commitment:
  - most land based activities that can affect water quality in the GBR lagoon fall outside the direct jurisdiction of the Great Barrier Reef Marine Park Authority
- Implementation of the regional Natural Resource Management (NRM) plans
  - No effective legislation and reliance on voluntary codes of agricultural practices
- Development of a sustainable region without a long-term strategic plan that incorporates major uncertainties ('the unexpected')

# Project goals

## To develop plausible alternative futures for the Great Barrier Reef (GBR) catchment for 2050 to:

- better understand key drivers of change;
- assess the consequences for ecosystems and society; and
- allow project collaborators to become better equipped by including uncertainty in their planning & policy development.

## To reach this goal, the scenarios address the following questions:

- What are the key factors driving change in the GBR catchment?
- What might the major land uses and industries be in 2050?
- How will governments, industries, and communities respond to change?
- What is their adaptive capacity?

# Why scenario planning?

- **A method for structured thinking about an uncertain and uncontrollable future**
  - Distinctly different from projections, forecasts or predictions
- **Examples:**
  - Royal Dutch Shell started scenario planning in the 1960s
    - Enabled Shell to envision a future no one thought possible, positioned Shell to handle the oil shocks better than its competitors
  - The Mont Fleur scenarios, South Africa, early 1990s
    - Brought together opposition political parties and stimulated discussion, ultimately contributing to the peaceful resolution of political differences
  - Millennium Ecosystem Assessment & PRELUDE
    - Explored alternative futures from ecosystem service and land use perspectives

# Scenario building method

1. Review existing data on past and present trends and drivers of change in the GBR catchment
2. Identify key issues and challenges
3. Identify and interview project collaborators responsible for the future development of the GBR catchment
4. Develop a set of draft scenarios for the GBR catchment based on the reviewed literature and interviews with collaborators
5. Revise draft scenarios with collaborators in a workshop
6. Finalise scenarios and evaluate the performance of the different scenarios (in comparison to current state)
7. Work with interested collaborators to apply the scenarios to specific policy or planning questions



# Key project collaborators – interviewees

- **Federal government**

- Great Barrier Reef Marine Park Authority

- **State government**

- DPI&F
- NRM&W
- EPA
- DLG

- **Regional organisations**

- Regional NRM bodies

- **Universities / research providers**

- James Cook University
- Central Queensland University
- University of Queensland
- Rainforest to Reef Research Centre
- CSIRO

- **Industry associations**

- AgForce
- Canegrowers
- Growcom
- Housing Industry Association

- **Indigenous groups**

- Giringun

- **Other organisations**

- Reef Water Quality Partnership
- Earthwatch Institute
- Council for the Humanities, Arts, & Social Sciences
- Australian Planning Institute
- Landcare
- WWF
- Australian Rainforest Foundation
- Business groups

# Key drivers of change

- **Population and demographic change**
- ***Governance and leadership***
- **Water availability**
- ***Climate change***
- **Oil/energy**
- **Infrastructure**
- **Environmental policy**
- **Industry**
- **Diseases**
- ***Globalisation***
- **Economy**
- **Tourism**
- **Attitudes and behaviour**
- **Information and technology**
- **Media**
- **Global security**

# Key drivers of change/uncertainties

## Climate change

*“The effect on the Great Barrier Reef through **climate change** is quite uncertain, and if that changes substantially it would change the attractiveness of the area.”*

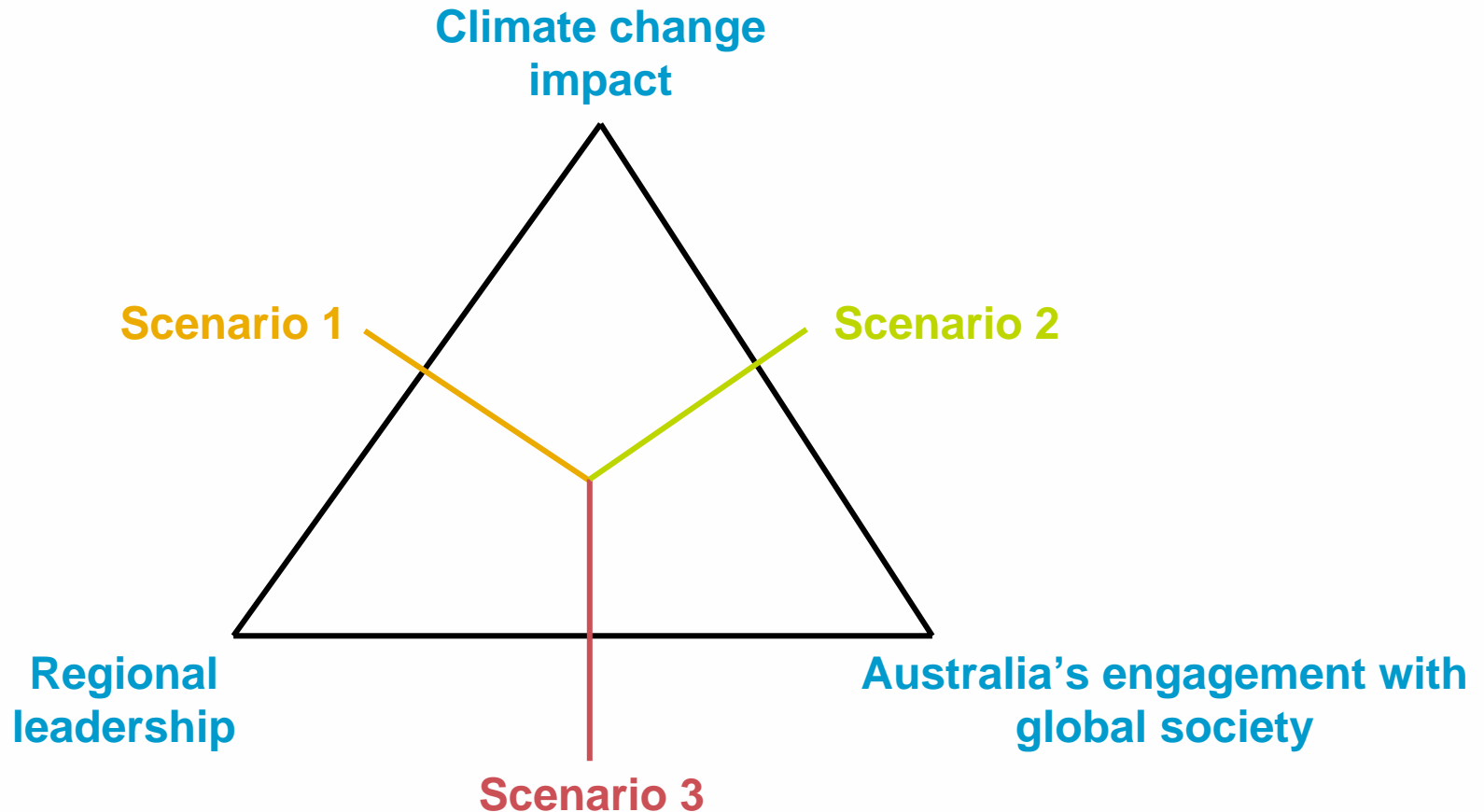
## Globalisation

*“I think in this period [...] a lot is going to be driven on how globalisation unfolds.”*

## Leadership

*“We do need to have very strong **leadership** ... we are not seeing that at this point in time at any level.”*

# Uncertainties affecting future of the GBR catchment



# Summary of key features

## Scenario 1:

### Major climate change impacts delayed, weak global engagement on climate change issues, reactive regional leaders

- Continued population growth due to rapid development of the coastal landscapes and movement of people from the south wanting a more laid-back lifestyle
- Resource boom continues
- Agriculture is export-oriented and intensifies in the GBR catchment due to water availability
- Conflicts over water rise related to the resource boom, intensive agriculture and pressures from the south
- Region becomes less attractive international tourist destination
- Biodiversity suffers from heavy exploitation of resources and fragmentation due to unplanned development

# Summary of key features

## Scenario 2:

### **Climate change crises trigger quick response; strong global engagement on climate change issues; proactive regional leaders**

- Population grows as environmental refugees are allowed to settle in the GBR catchment
- Shift to 2-tier governance structure
- Major steps taken to develop coal alternatives; sugar is produced for biofuels and high value products
- Reduction in international air travel
- Balancing of agricultural production for regional/international markets to adapt land use to climate change context
- Water planning improves on multiple scales, water saving schemes are implemented. The cost of water necessarily rises, causing the agricultural sector in particular to make adjustments
- Better protection of coasts and wetlands to enhance their flood protection as well as other ecosystem services (e.g. disease regulation)

# Summary of key features

## Scenario 3:

### **Climate change crises; weak global engagement on climate change issues; reactive regional leaders**

- Reduced development along the coast due to cyclones, tropical diseases and the cost of energy to cool buildings
- Resource boom slowed down by reduced trade with partners such as China
- Agricultural industries find it difficult to adapt to changing climate variability, new industries that are more robust to climate change emerge only slowly
- Conflicts over water rise due to pressures from the south
- Tourism declines because the 'natural values' of the Reef and Rainforest suffer from climate change and a lack of management

# How will the scenarios be used?

## Based on the feedback received to date from our collaborators the scenarios will be used:

- to inform the review of the regional Natural Resource Management (NRM) plans;
- as input into the Far North Queensland 2025 regional plan;
- to inform strategic planning of industries;
- to adapt land management actions;
- as educational and communication tool that forces people to think beyond business-as-usual.



## Sustainable Ecosystems

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# Thank you

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