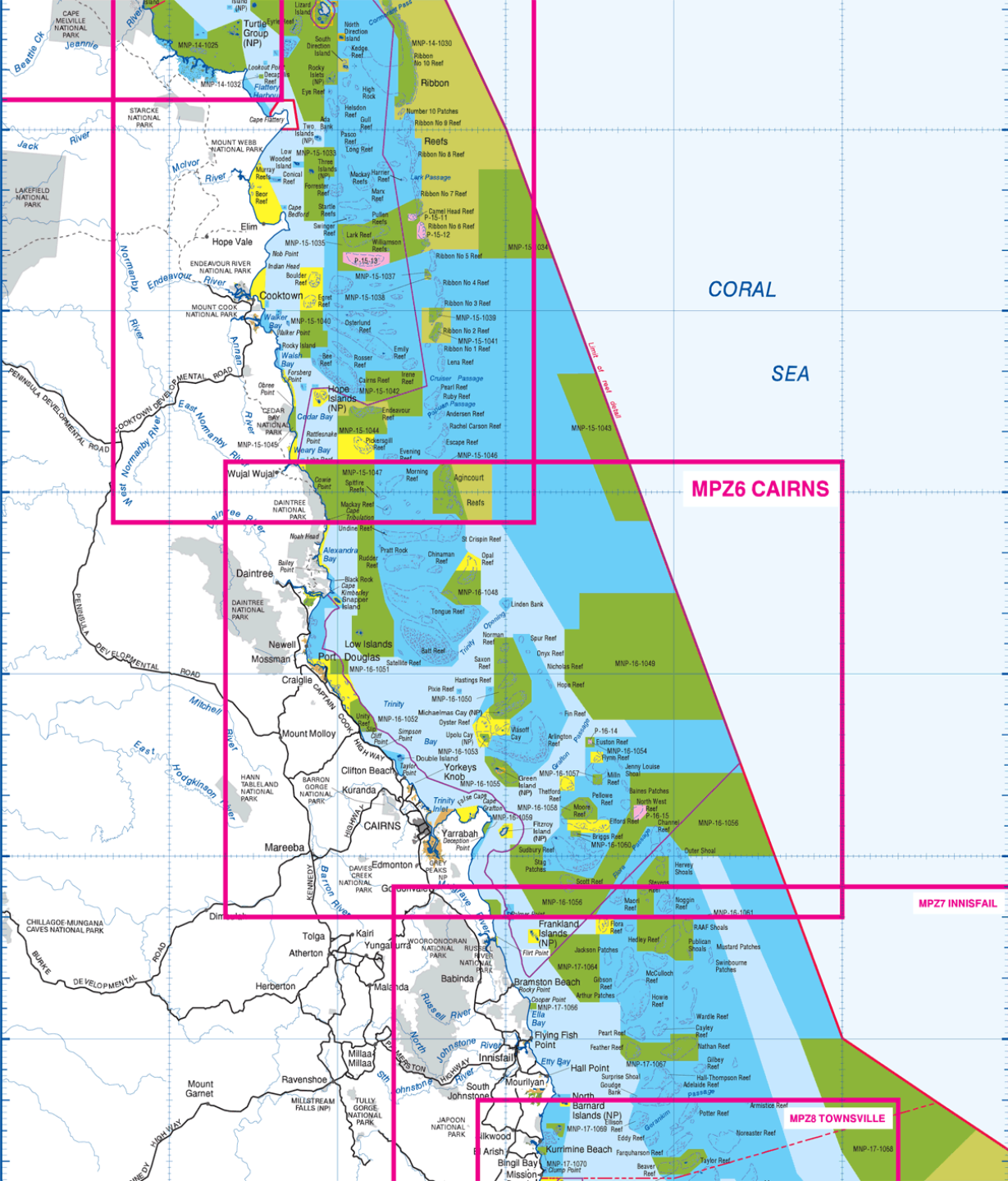


# Climate Change and the National System of Marine Protected Areas

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# **1. Put MPAs into broader context**



# Broader Management Context

MPZ6 CAIRNS

MPZ7 INNISFALL

MPZ8 TOWNVILLE

# Broader *Spatial* Context

## Land-sea connections

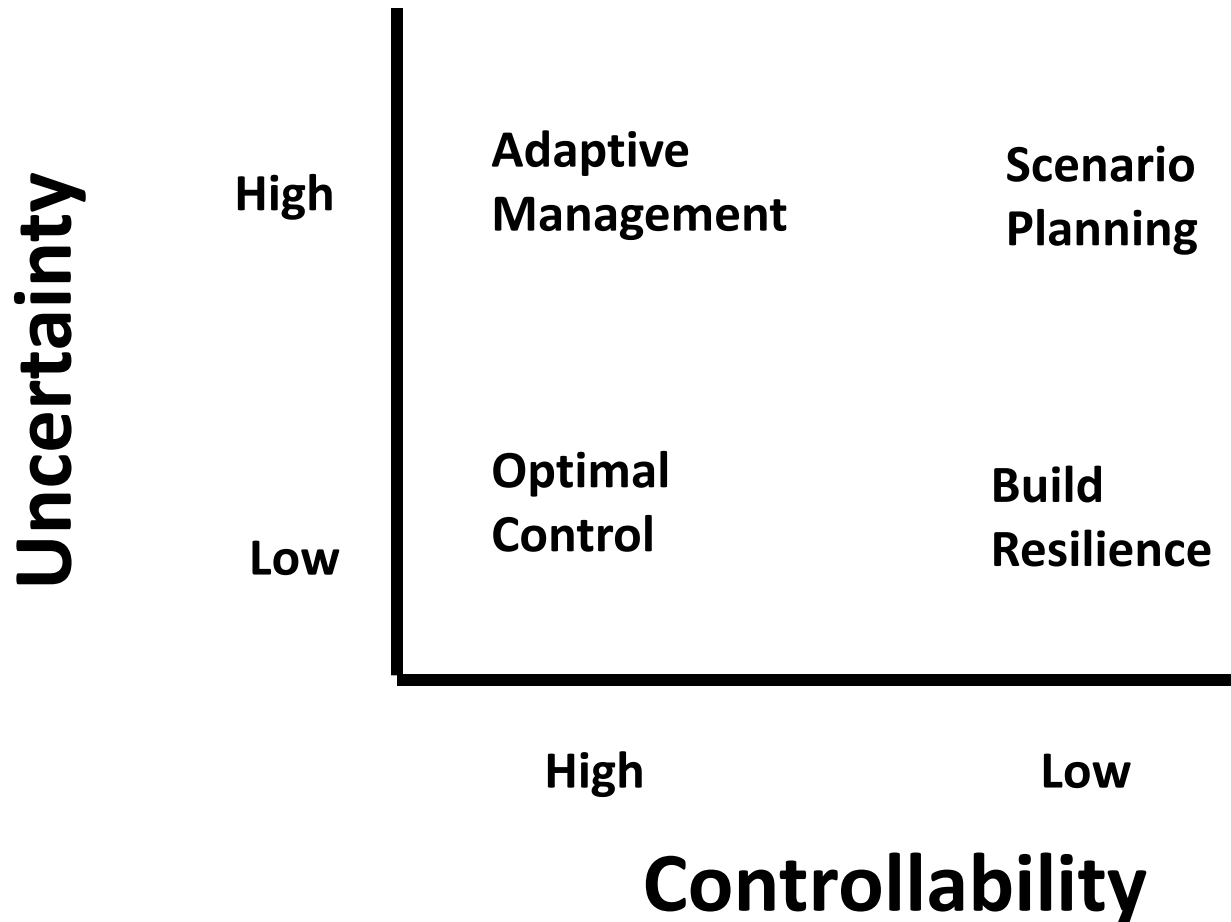
- \* Release of toxic material due to sea level rise
- \* Changes in terrestrial input (e.g. sediment, freshwater)
- \* Landward shift of marine ecosystems



## Great Barrier Reef:

Water quality influences bleaching risk → working with national, regional, local governments as well as watershed landowners/land users to improve water quality

# 2. Manage for Uncertainty



Scenario Planning: what information would actually make a difference to what we do?

# *Experimental* Adaptive Management

- Try different management approaches in different places;
- Best available science says: uncertainty is high
- **MUST** have monitoring

### 3. Find/Create Refugia

- Include refugia explicitly as element of MPA coverage
- Limit local/regional change, e.g.
  - NO<sub>x</sub> and SO<sub>x</sub> contributions to acidification
  - Protect/restore processes supporting shoreline accretion (biological and physical)



## 4. Build Climate Change into Existing Frameworks, Plans, Regulations, etc.

- Designing and managing MPAs and designing and managing MPAs for climate change should be the same thing in today's world
  - Climate change + MSYs
  - Climate change and acceptable pollutant levels
  - Climate change and critical habitat designations

Human systems are as complex and varied as ecological systems.

<b>Ecological Concept</b>	<b>Human analog</b>
Range shifts	Migration/resource use shifts
Shifting Community Assemblages	Ditto (new resource conflict, e.g.)
Pristineness	Pristineness (community “intactness”)