Climatic Risk Management in Water Planning in Australia

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Acknowledgements:

NWC

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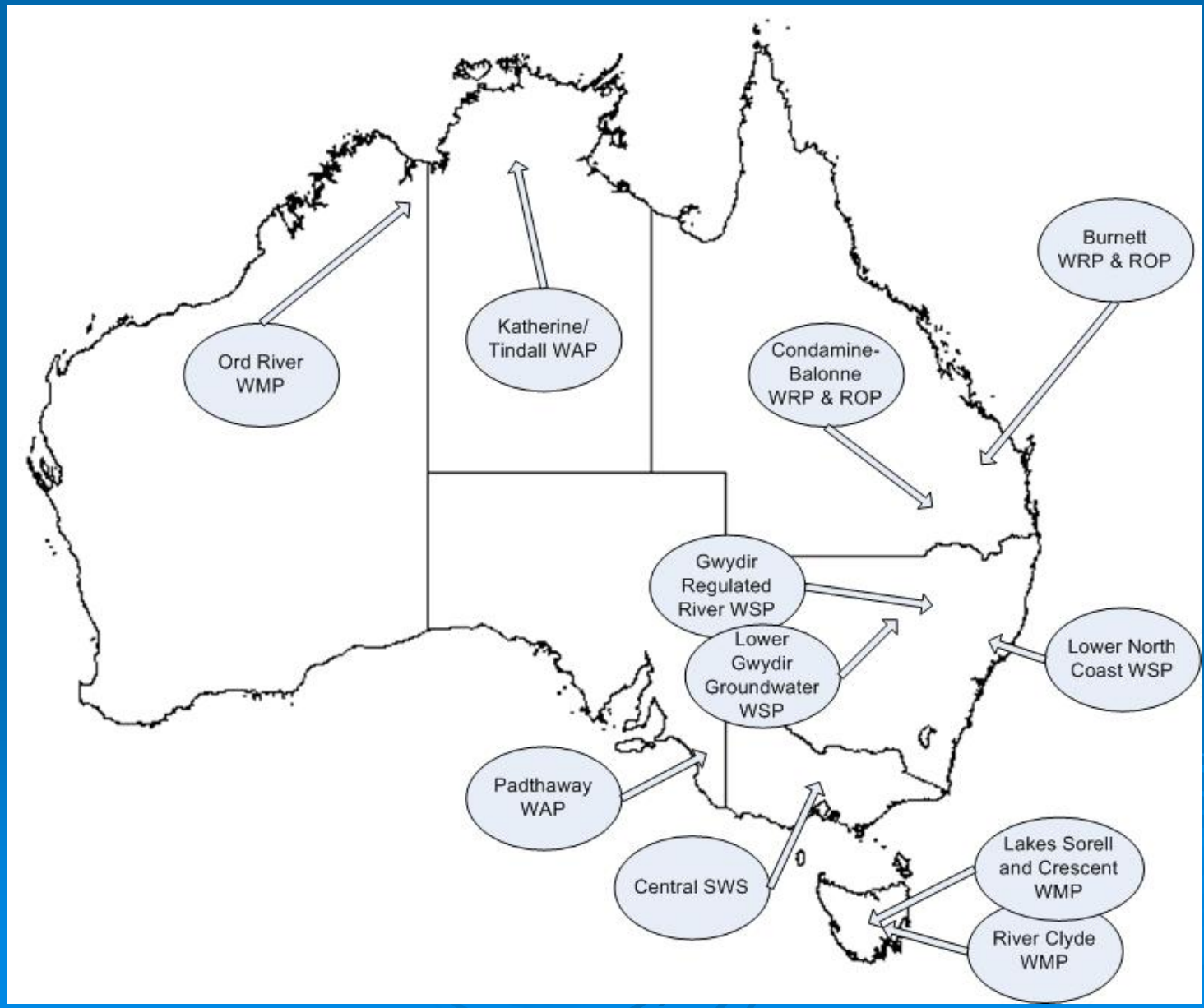
Agency staff and community stakeholders

Water allocation planning

- A central focus of the NWI
- Sharing and managing surface and underground water
- Principle mechanism for
  - establishing environmentally sustainable use of water resources
  - establishing security of water entitlements
- Platform for making fundamental trade-off decisions

Water planning study - 2007



Ecologically sustainable water management

- Can we sustainably manage water ecosystems without consciously identifying and managing risks that are likely to result in serious or irreversible damage ?

- Can we have water planning for ecological sustainability that does incorporate explicit rigorous risk management ?

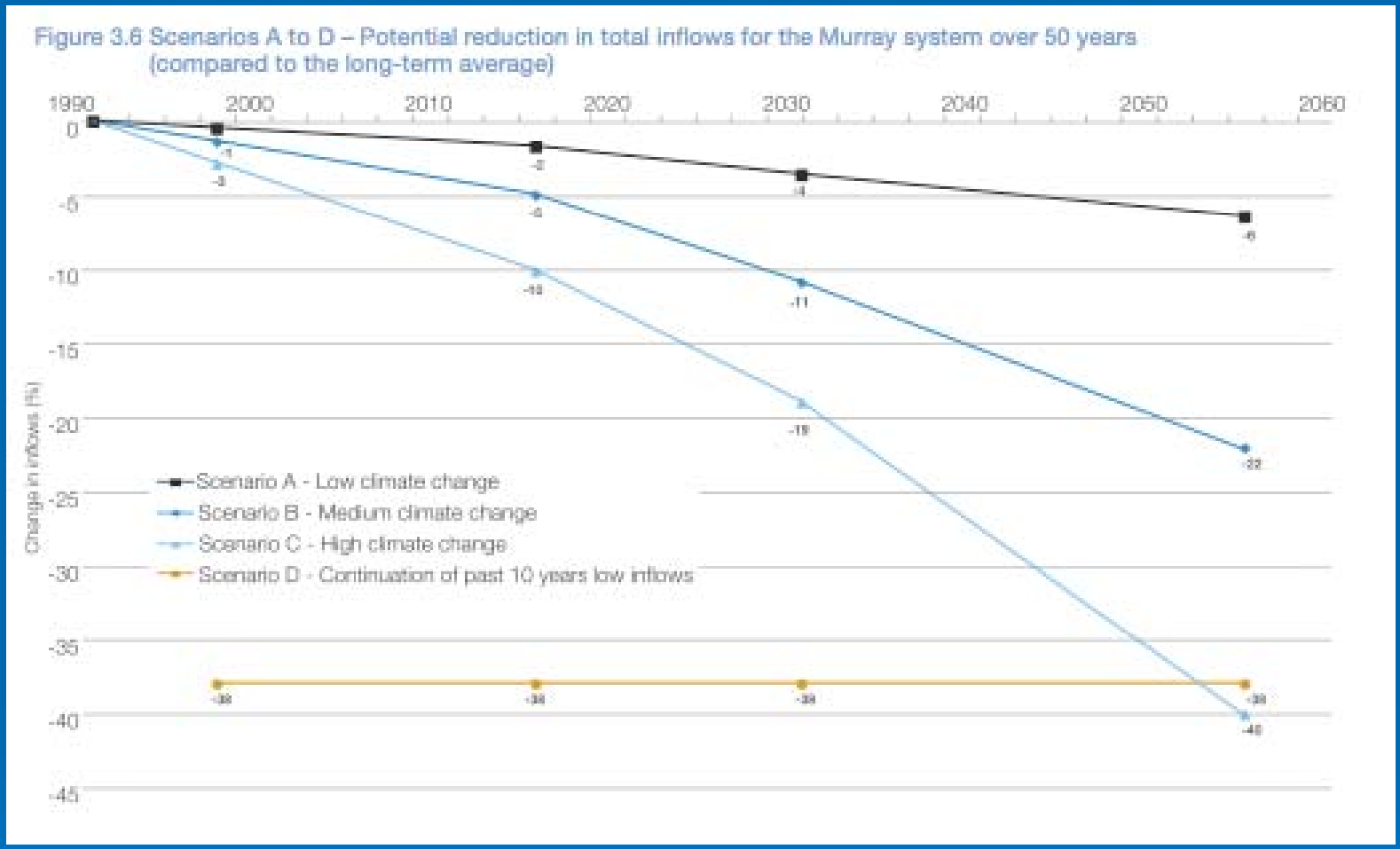
Risk management

1. assess risk
    - identify potential risk triggering events
    - consequence
    - likelihood
2. determine response
    - immediate responses (before the event)
    - contingent responses (when the event occurs)
    - recovery responses (after the event)

Last 2 responses require an adaptive management process

Climatic risk identification

- until recently all plans have assumed continuation of past climatic patterns
- while many include aspects of risk management, only Victorian case study assessed climate change scenarios
- climate change has most impact in extreme events



- (from Vic Northern SWS Discussion Paper 2008)

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Consequence assessment

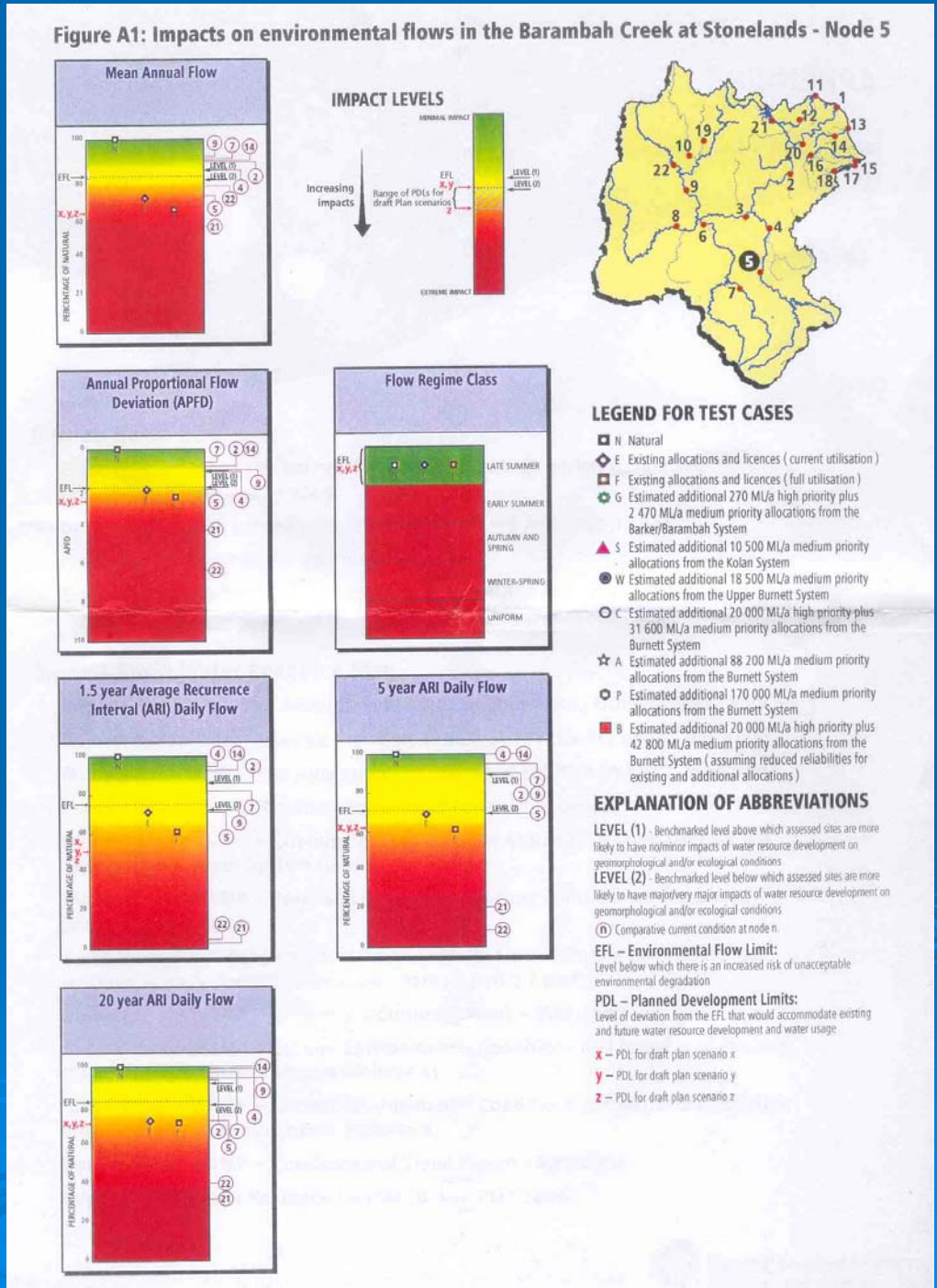
- considers the impact on individuals, communities and environmental assets.
- should take into account:
  - value
  - spatial extent
  - capacity to recover ie resilience
  - temporal extent
  - cost of recovery vs prevention

what we observed

- Victorian Central SWS assumed that urban water supplies must be provided – ie the consequence of not doing so is catastrophic.
- potential effect on communities through agriculture and industry water shortfalls not stated/assessed
- potential effects on environmental assets (potential loss of damage) was not stated/assessed
- more recently the Victorian Northern region SWS discussion paper has provided impacts of a range of scenarios on water availability for towns, irrigation and agriculture.
- it also goes further in providing indications of the likely damage to environmental assets under these scenarios

Enviro consequence assessment

- Burnett ‘traffic light’ diagrams



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Likelihood assessment

Considers the chance of an event or sequence triggering the impact occurring. It should consider:

- probability of the event occuring
- vulnerability to the event
- the precautionary principle should be applied to environmental risk assessment

what we observed

- all climate scenario forecasts have a high degree of uncertainty (best available science at the moment)
- Central SWS assumed worst case future climate scenario likely for urban water supply planning, but assumed continuation of current conditions for environmental water planning
- more recently the Victorian Northern region SWS discussion paper considers equally a range of scenarios on water availability for towns, irrigation and agriculture and the environment.

NSW rapid assessment matrices

High Instream Values	**A** Upper Barrington, Myall Lakes, Cooplacurripa, Upper Barnard Myall Creek, Lower Barnard Rowleys, Nowendoc	**B** Mid Manning	**C** Myall River, Coolongolook, Wallamba, Lower Barrington/Gloucester, Upper Manning, Upper Gloucester, Lower Manning, Bowman
Medium Instream Values	**D**	**E**	**F** Manning Estuary Tributaries, Dingo
Low Instream Values	**G**	**H**	**I** Avon, Manning River Tidal Pool
	Low hydrologic stress of hydrologic risk	**Medium hydrologic stress of hydrologic risk**	**High hydrologic stress of hydrologic risk**

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Responses to risks

- Central SWS included a range of strategies to address urban water supply risk
  - immediate investment in infrastructure to increase water supplies and options (alternative supplies, cross connections)
  - investments to reduce demand
  - contingent advancement of investment in infrastructure triggered by low flow sequences should they occur
  - 7 year buffer or reserve

Responses to risks

- For environmental risks, Central SWS provides for preparation of drought response plans to identify key drought refuges in rivers and actively maintain them.
- Queensland ROPs provide for the preparation of ‘critical water supply arrangements’ which determine how water should be shared should severe water shortages occur

Adaptability built in – how?

- plan review – 5- 10 years, depending on State - some plans build in review based on certain triggers eg Clyde, Condamine-Balonne (Ord is 3 years)
- emergency provisions of Minister to declare emergency and/or limit water take – most jurisdictions
- implementation flexibility – eg Qld WRPs and ROPS, Vic EWR
- water user adaptability – trading, co-management
- commitment to ongoing monitoring, research, assessment, continuous improvement varies

Comments and issues

- assessing and managing climatic risks is an essential ingredient to ESD
- water planning in Australia is only just beginning to incorporate risk management as a fundamental tool.
- there are well developed standards and approaches to risk management that can be applied.
- good ongoing investment identifying a range of future climatic scenarios through CSIRO and others.
- high level of uncertainty of future climate requires worst case scenarios to be planned for as if likely (precautionary principle)

Comments and issues

- only just beginning to address uncertainty about risk to environmental assets (critical ecological ‘thresholds’, drought refuge habitats etc)
- building adaptive management into plans with triggers, monitoring programs, identifying data gaps and process for filling gaps, and reviews is essential – monitoring should be focused where risk and uncertainty are high
- socio economic risks poorly addressed (are there critical thresholds here also?)

Comments and issues

- certainty vs adaptability
- scope limitations eg except for Vic SWS plans do not address demand management; when they do, they usually focus on economic mechanisms such as pricing rather than awareness and compliance

Conclusions

Incorporating risk management into water planning:

- Better up front risk assessment
- Contingency planning – scenarios
- Identify triggers for early action
- Focus monitoring on identified risks and triggers
- Transparency in monitoring and reporting

THE GREATER THE RISKS AND UNCERTAINTY, THE MORE NEED FOR FLEXIBILITY AND ADAPTIVE MANAGEMENT