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Frontiers in adaptation science: Food security/natural environments

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Presentation to Climate Adaptation Conference, June 2010, Copyright CSIRO

National Research
FLAGSHIPS
Climate Adaptation



The food security and environmental challenges before us

Increasing food production by ~70% by 2050 given

- population growth
- per capita consumption growth (in some nations)
- **adapting to climate changes**
- emission-reduction needs
- increasing input constraints (fuel, N, P, water)
- degradation status of terrestrial/marine resources
- biodiversity status and threatening processes
- lower R&D expenditure
- increased volatility incl. through a range of governance issues etc etc

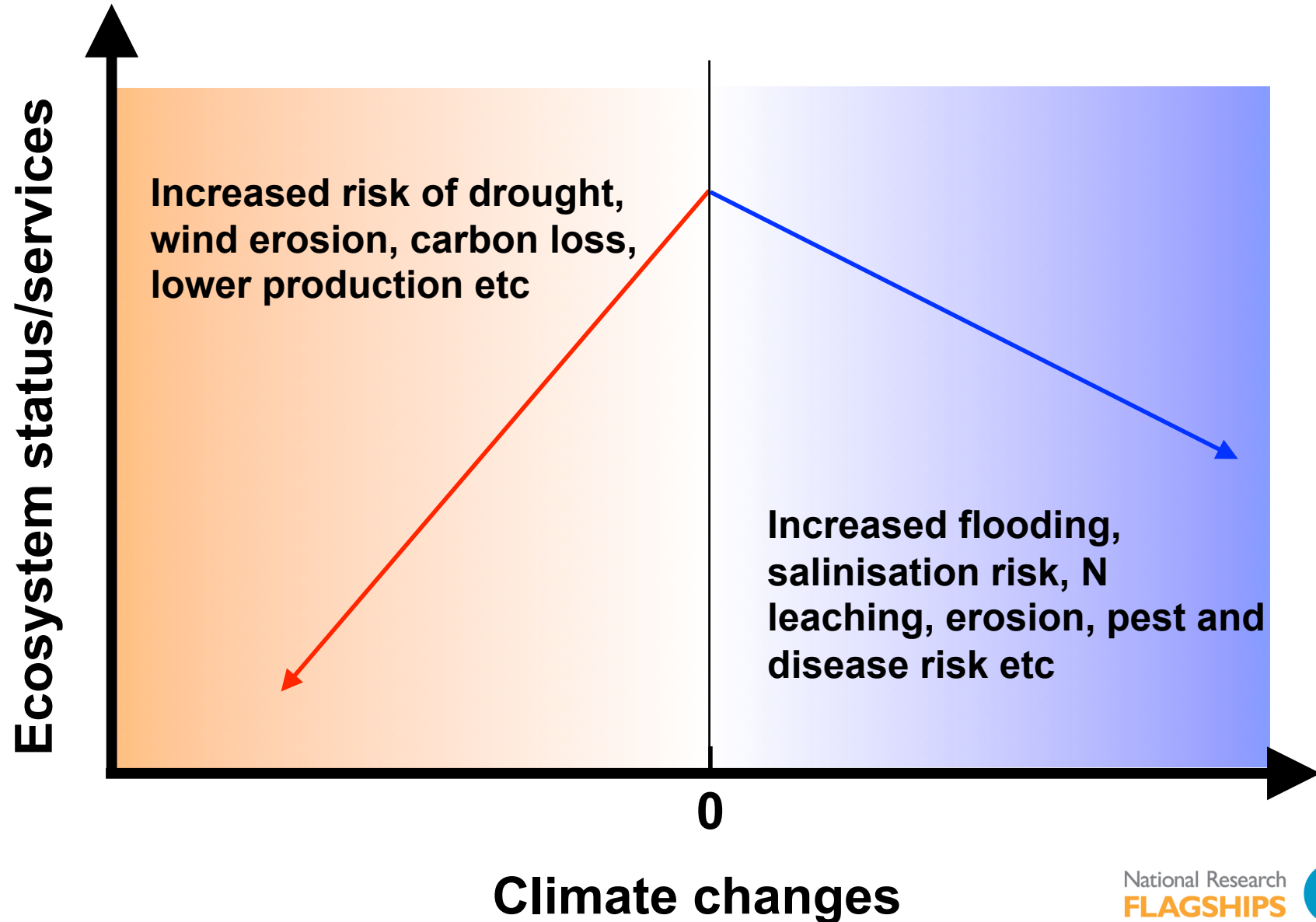
Has the science more broadly adapted ?

- Narrow disciplinary and institutional perspectives have provided few practical options for policymakers dealing with the complex and interacting goals of adaptation
 - climate-centric not human-centric
 - identify the problem but not solutions
 - pressure to reduce policy goals to fit the scientific methods and agendas
- Instead, we argue the nature of the problem should determine the relevance of the science that is available

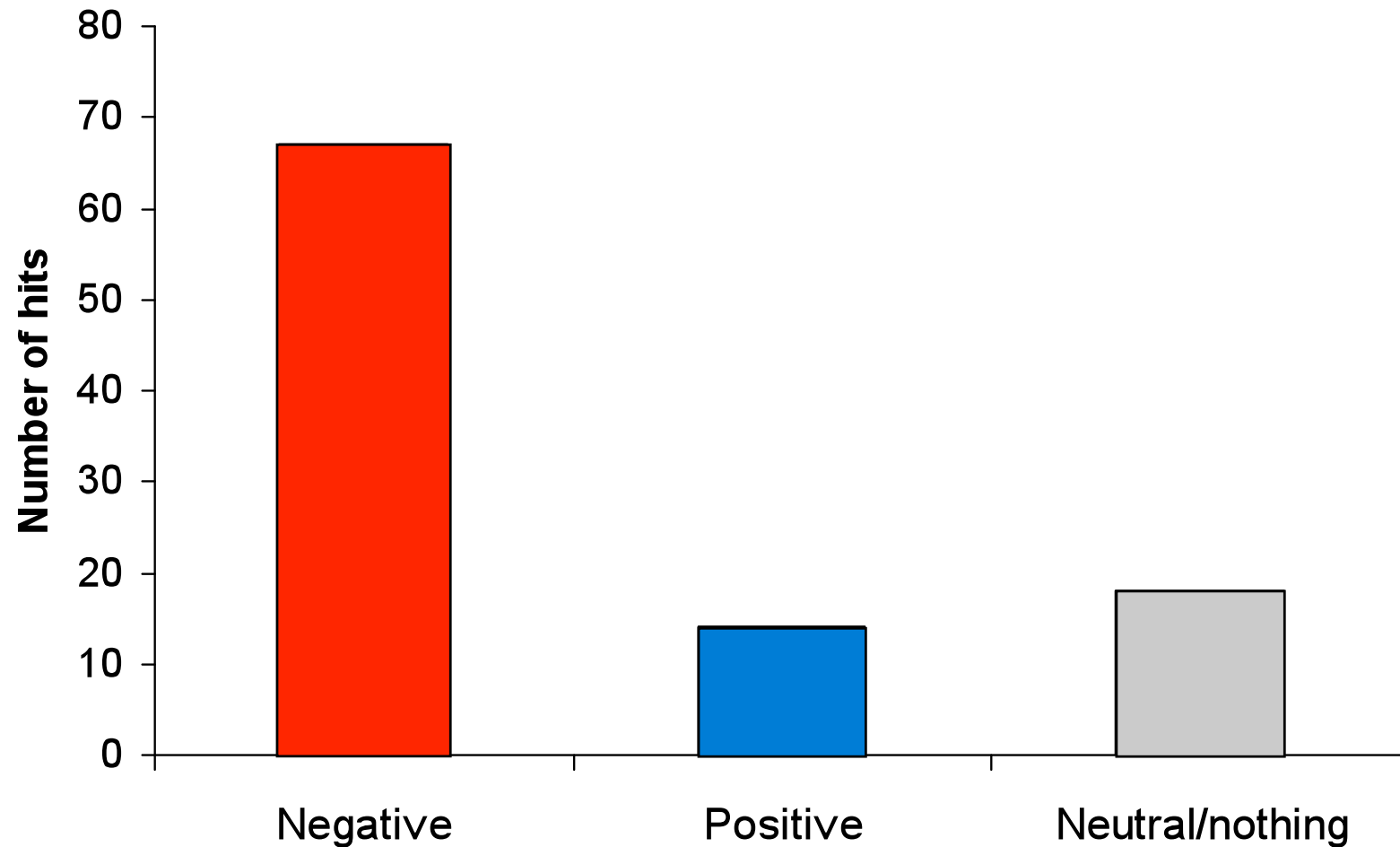
More relevant, legitimate information

- move away from the climate-centric focus
 - to a decision-centric, outcomes focus
- provide information at the timescale of need
- at the spatial scale of need
 - e.g. don't use a farm model nested in a GCM running on a supercomputer to look at farm level options
- decision-scale information and delivery
- integrating climate variability and climate changes and these with other key decision issues
 - context is (almost) everything

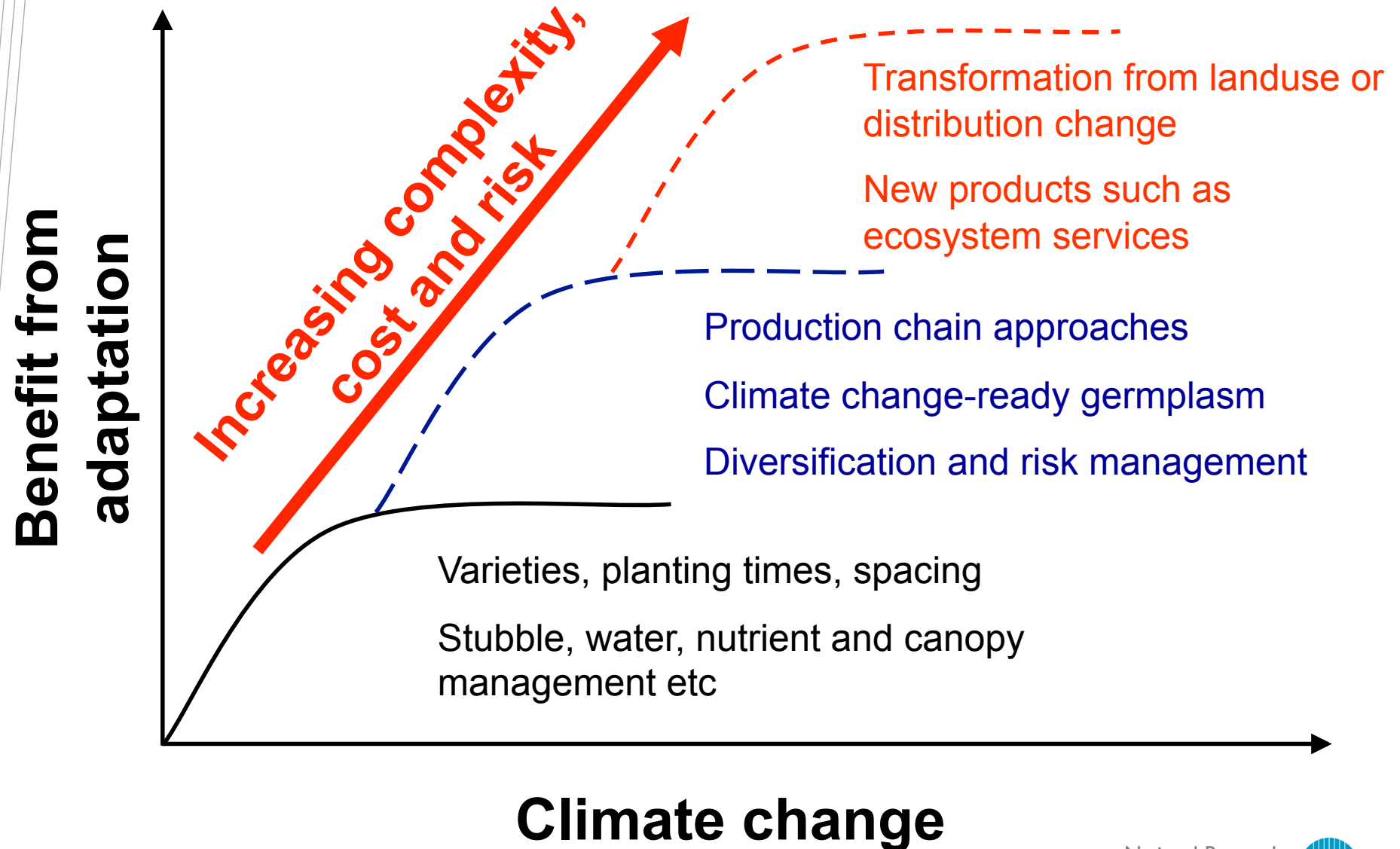
Overcoming a Panglossian view of climate



Framing of the issue: session abstracts

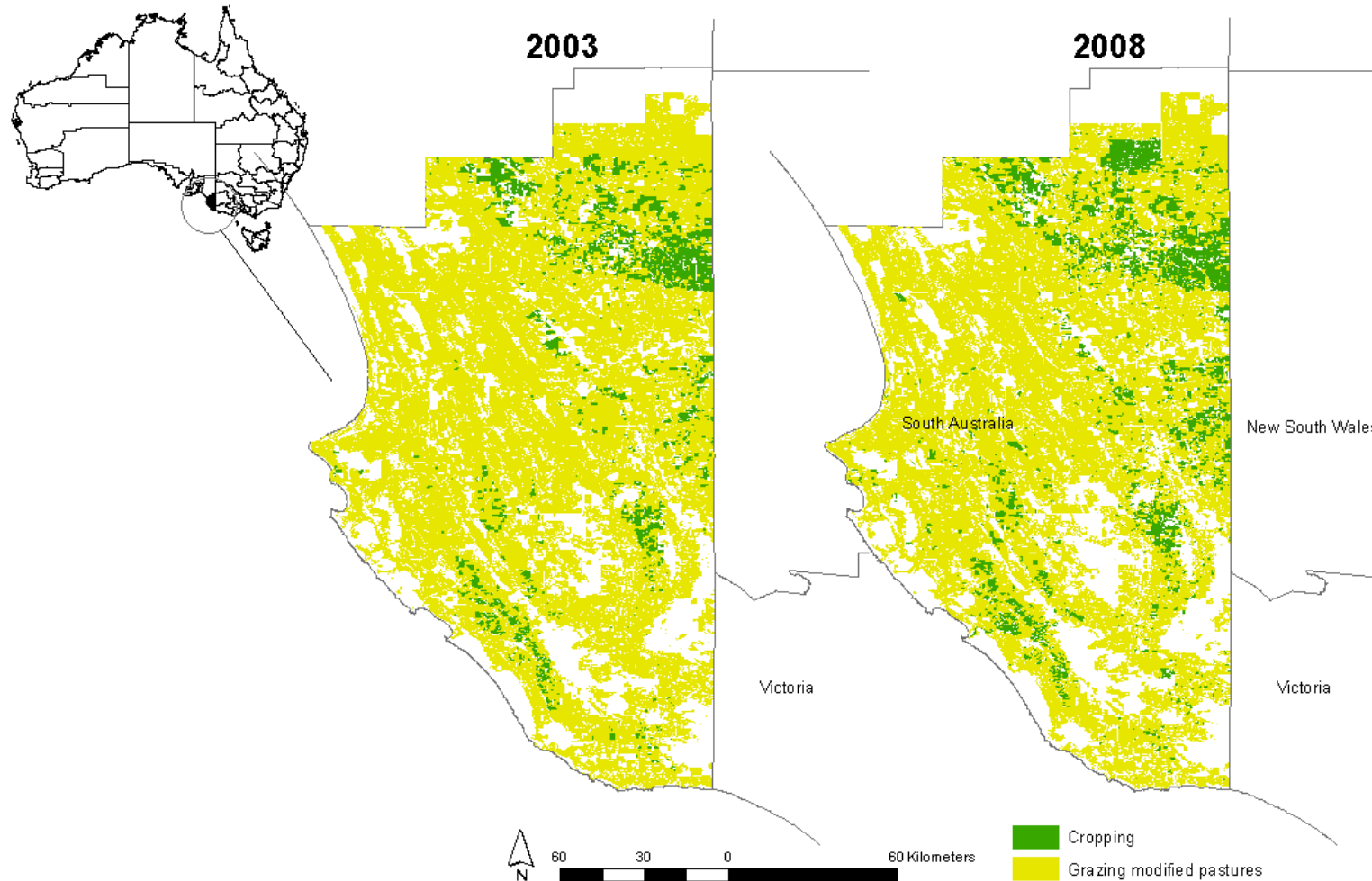


Progressive adaptation and opportunities



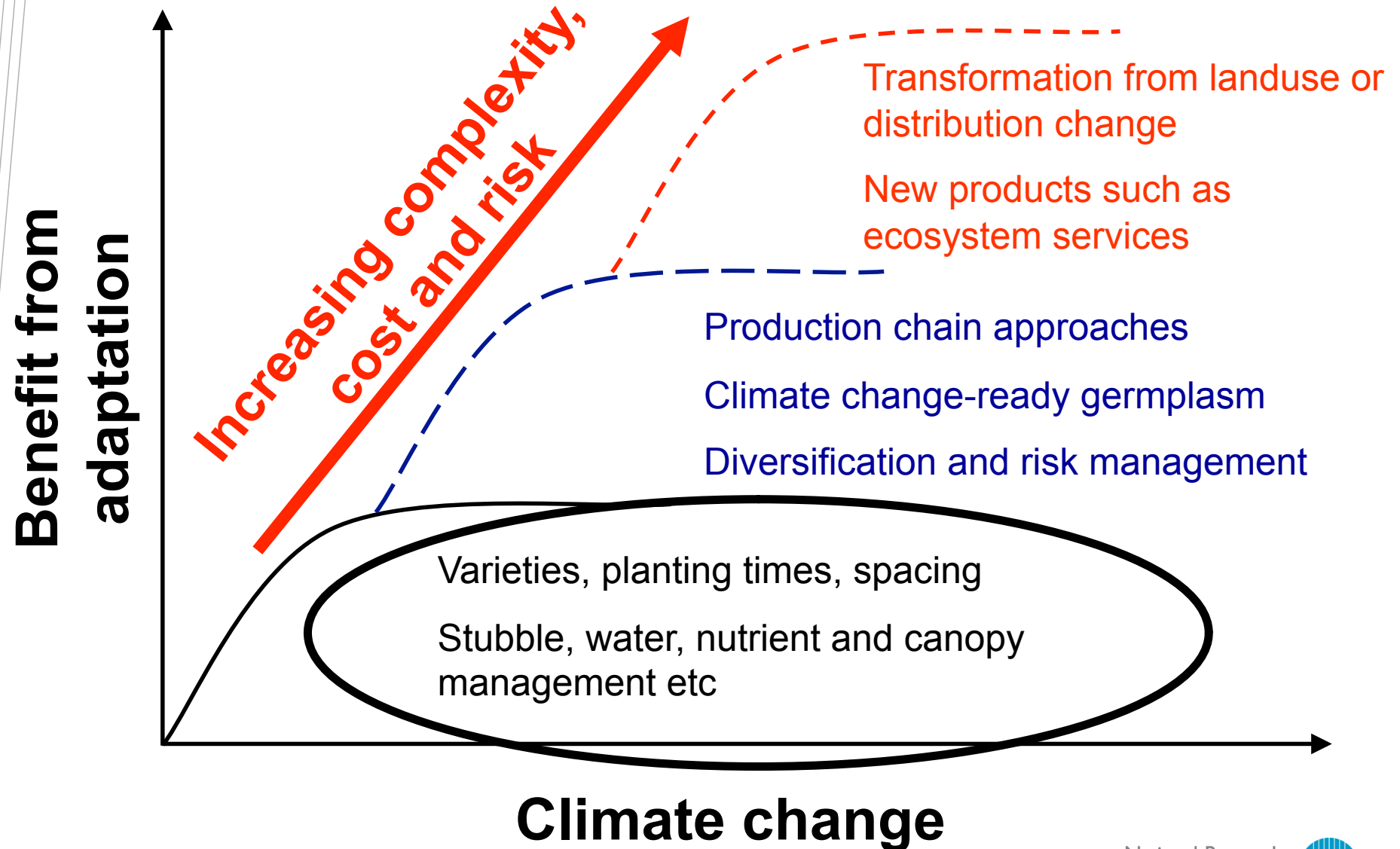
(Howden et al. 2010)

Opportunities: landuse change



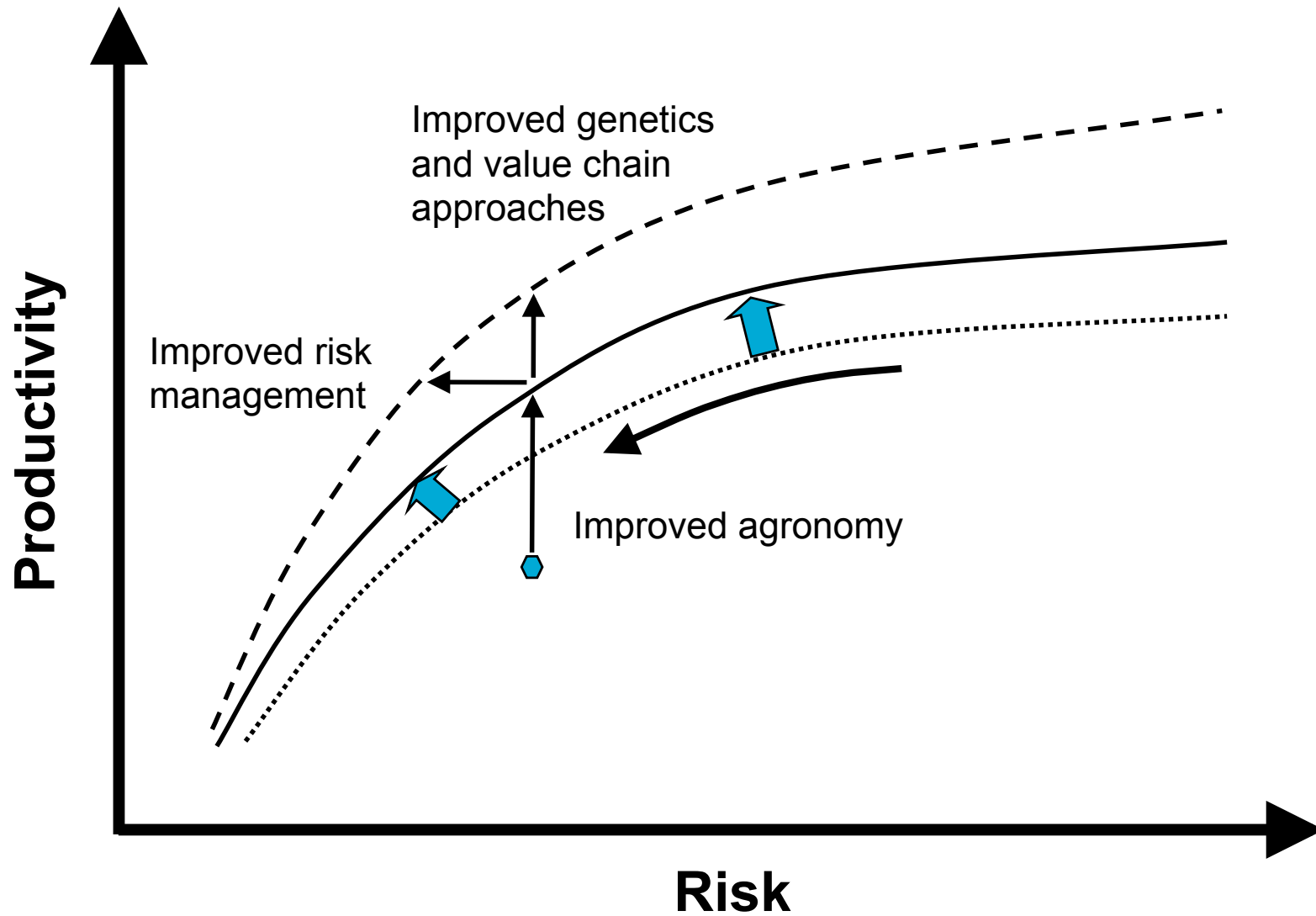
An extra 52000ha cropped: Nidumolu (2010)

Progressive adaptation



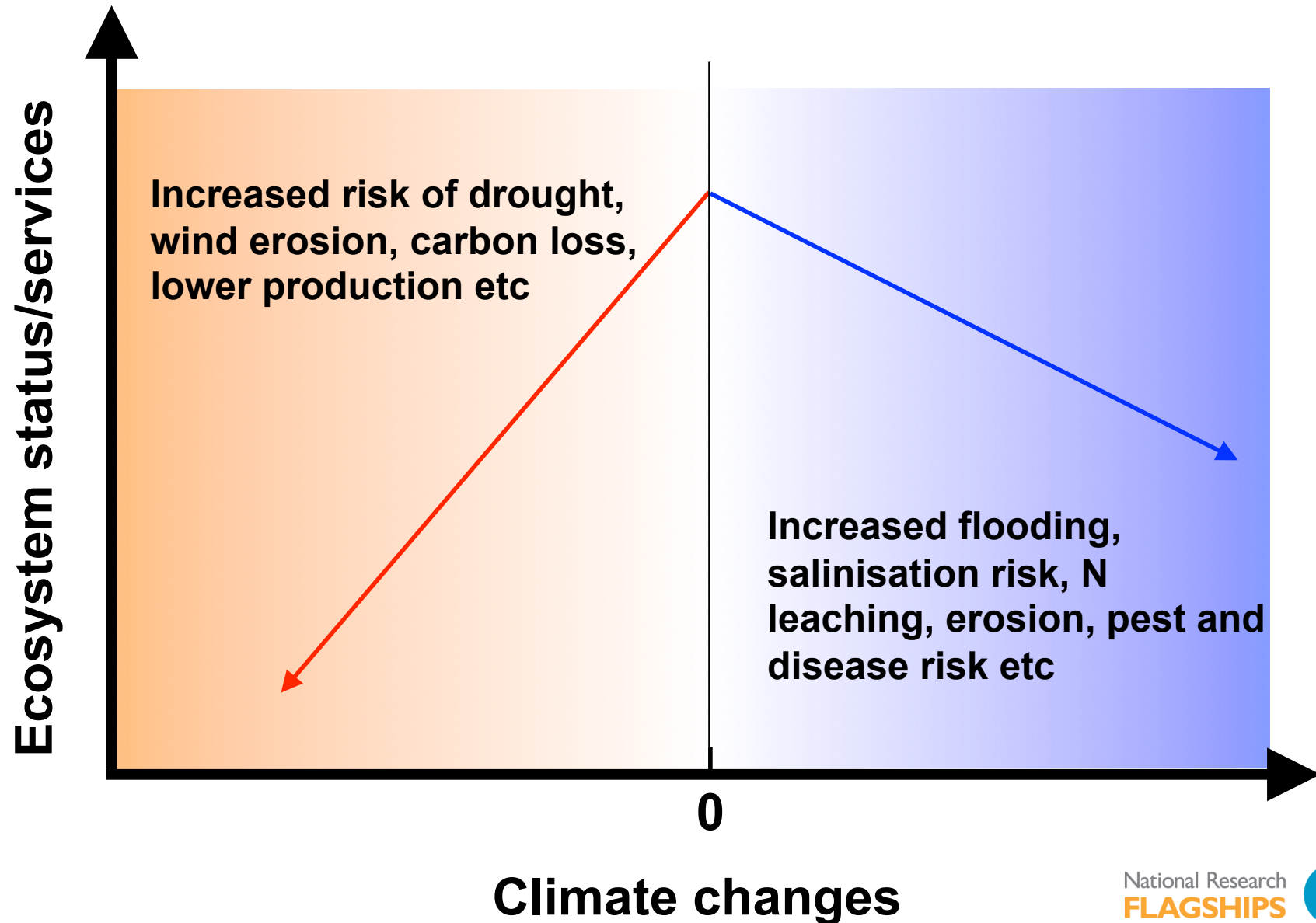
(Howden et al. 2010)

Risk-return frontier



(modified from Carberry and Keating 2010)

Expectations: a psycho-climatic barrier ?



Attachment to the past climate

‘Spewful climber treely’

– *Afferbeck Lauder* (‘Let’s speak Strine’)

‘It’s a beautiful climate really’

– *translated into English*

- Some things are best learnt by doing
- ‘Doing’ adaptation means decision-makers need to be involved



Engagement with decision-makers and the final front-ear

- adaptation scientists need this third ear too, specifically for *listening* to the decision-makers we want to influence
- top-down analyses tend to exclude from the process those who want the information
- perpetuates a long tradition of one-way information flow

People don't like the 'knowledge injection' model



Engagement: participatory action research

- Better define the questions
- Co-invest – build a bigger team
- Co-design research
- Pool knowledge
 - scientists often not the dominant knowledge holders
- Own the solutions, operate the ‘tools’
 - broader range of solution options
- Relevance, credibility and legitimacy
- Relevance *and* rigour

Cash and Buizer (2005)

Maximising learning from effective comparisons

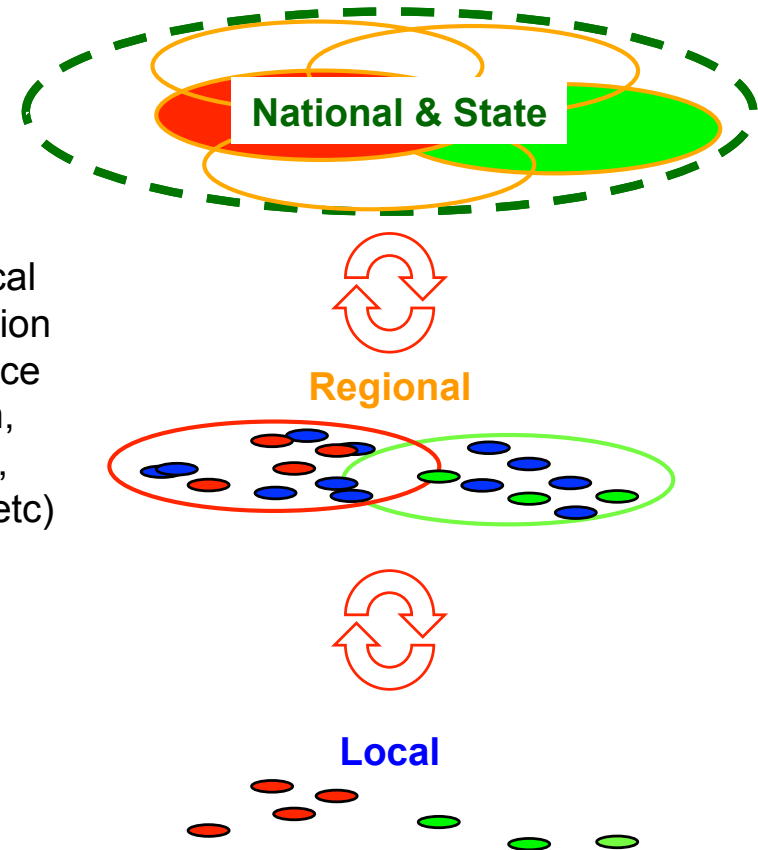
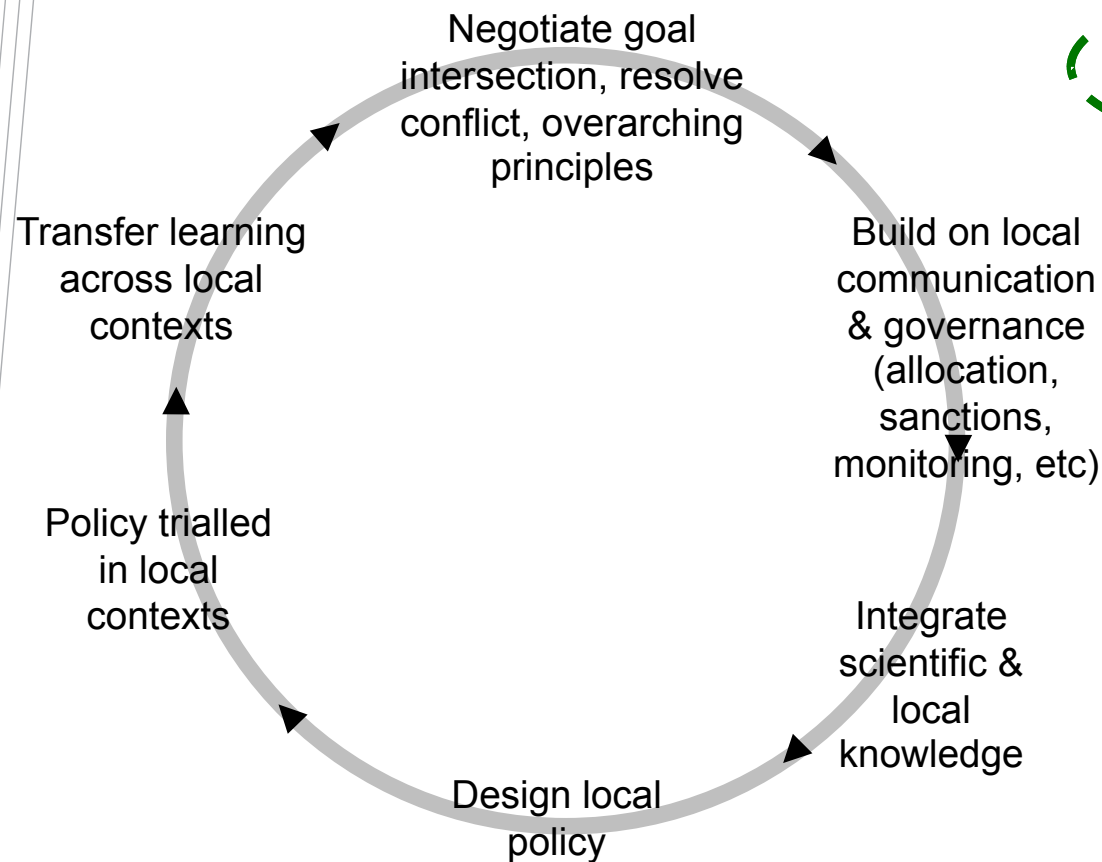
- using the same methods in different locations
- OR
- using different methods in the same location
 - GCAFS (John Ingram, Global Change and Food Security)
 - Adapting farming systems project (Steve Crimp, Australia)
 - effective monitoring and evaluation

Institutional and policy environment is critical in supporting adaptation



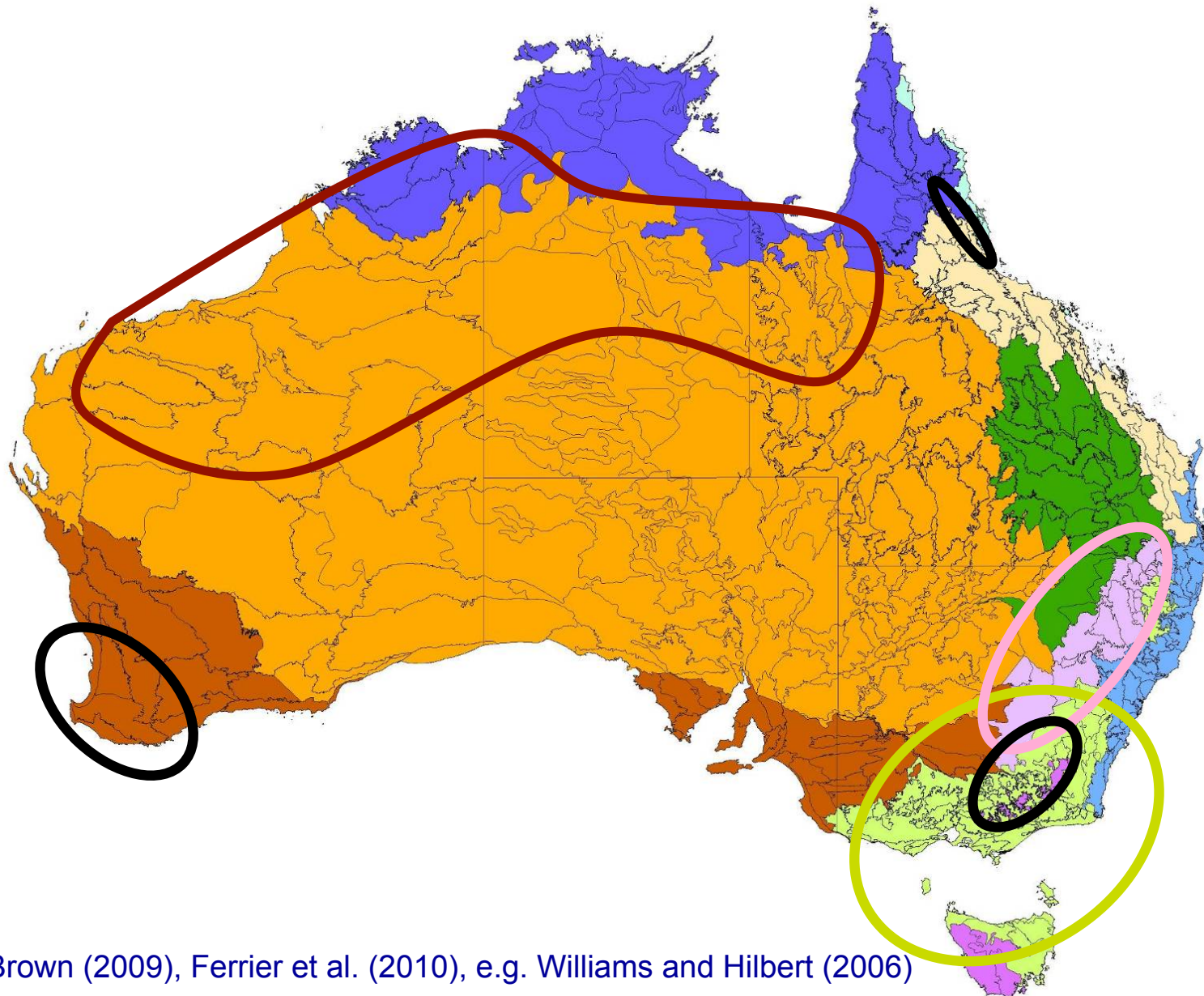
Nelson et al. 2009

Adaptive, cross scale models of governance



Nelson et al. 2009...from Ostrom (1999)

Biodiversity: methods matter



Dunlop and Brown (2009), Ferrier et al. (2010), e.g. Williams and Hilbert (2006)

Revisiting conservation: objectives and values

“Manage the change to minimise the loss”

Value

Individual species
or genes

Inevitable change !!!

Abundance, distribution
and co-occurrence

- Align the methods to fit the goals not vice versa
- Rationale for social science in adaptation

Summary of frontiers

- many I have not raised.....
- decision and outcomes focus
- balance in framing risks/opportunities
- incremental thru to transformational change
- productivity-based research
- enhanced engagement and communication
- adaptive governance
- maximising learning
- aligning methods with values/goals

Climate Adaptation Flagship

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Thank you

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