Seasonal climate forecasts as a pathway for climate change adaptation: a review

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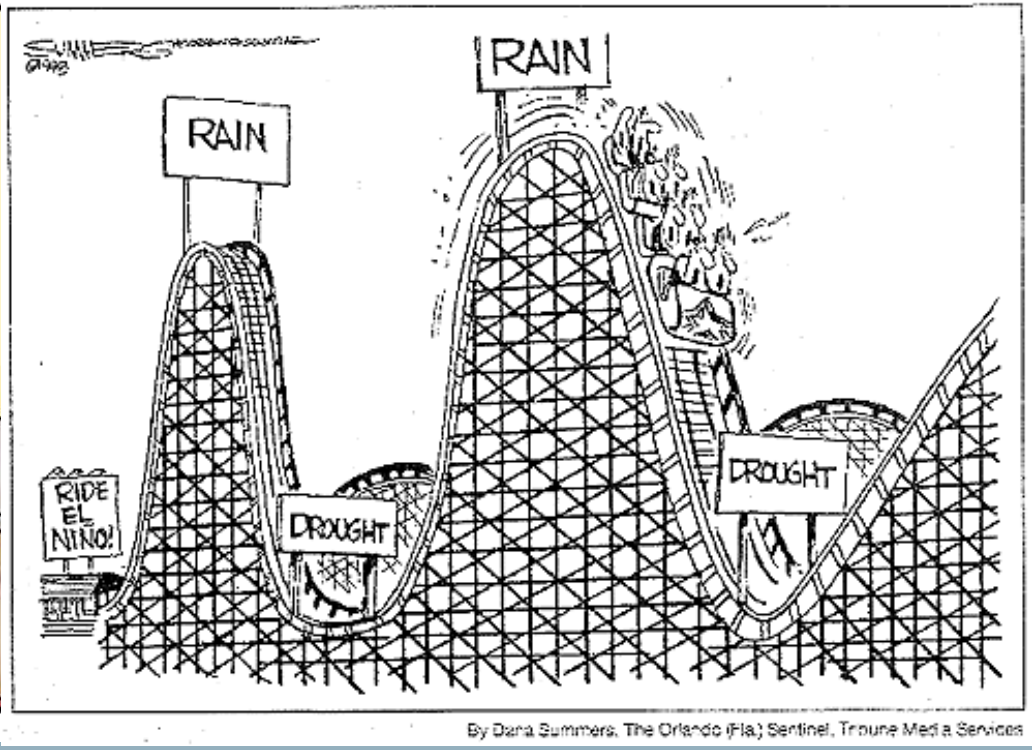
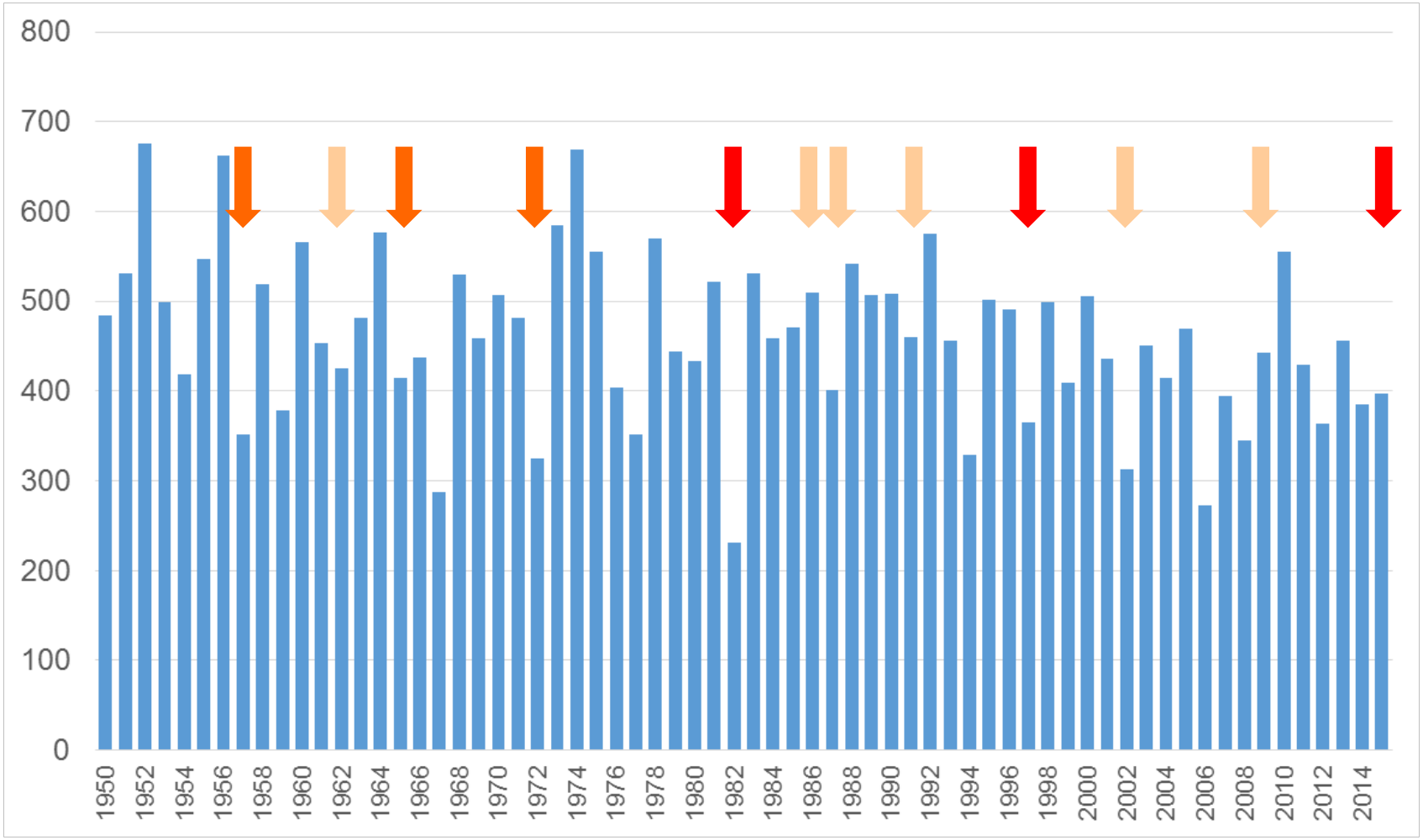
The basic idea

Proposition: if SCF available, robust and used appropriately, then they are one among several ways of adjusting year-by-year to climate change as their use would adjust autonomously to changes in frequency of extremes



McKeon and Howden 1991, McKeon et al.1993

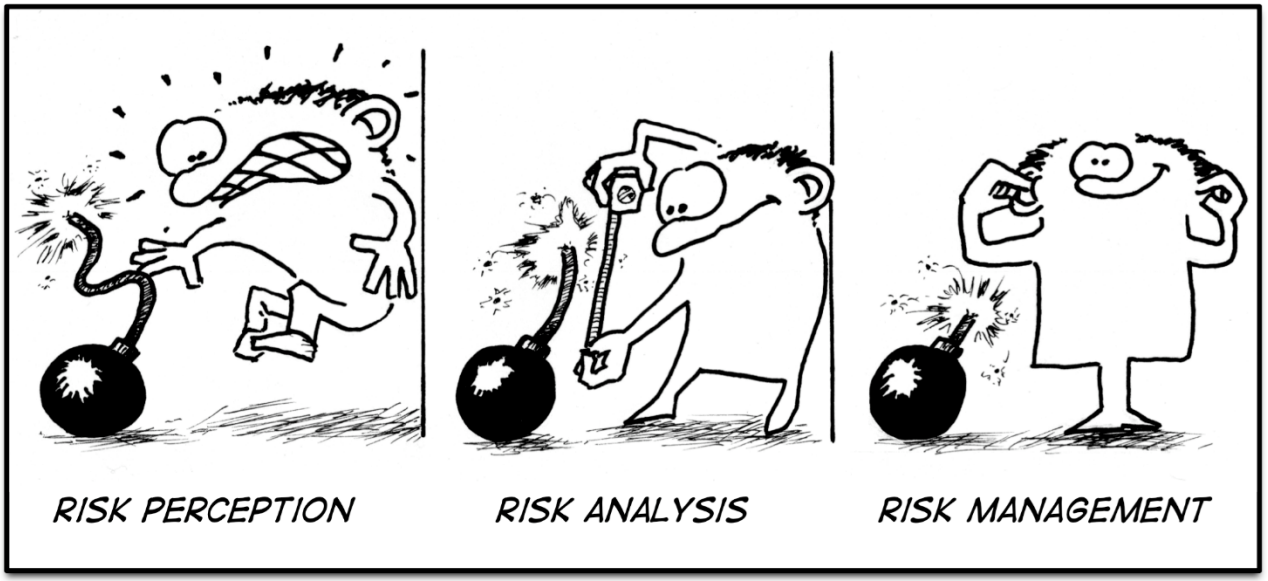
El Niño and rainfall links (SE Australia)



Data Australian Bureau of Meteorology, 2016

A ‘stepping-stone’ into an uncertain future

- Stepping stone, bridging near-term climate variability and longer-term climate change
- Stimulus and eventual route to climate knowledge adoption and improved risk management



- Subsequently, research into the experience of decision-makers with SCF has identified limitations as well as support for this proposition

McKeon and Howden 1991, McKeon et al.1993, Rickards et al. 2014

Chronology of this idea

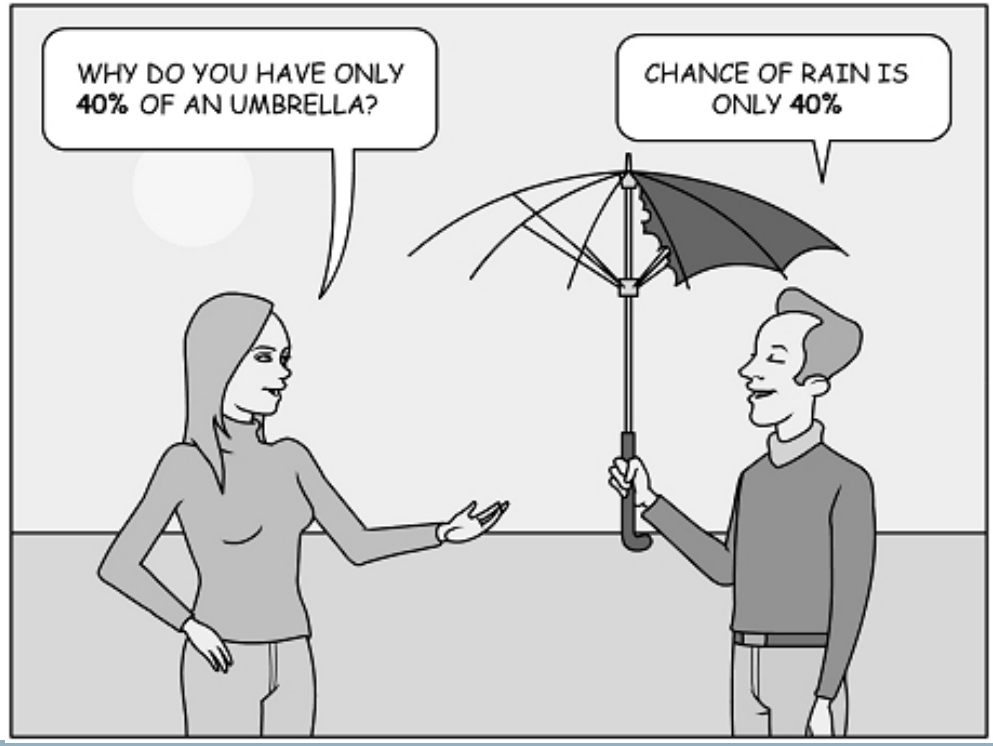
- 1988: first linking agricultural management and ENSO (McKeon et al. 1990)
- 1991: use of SCF to adapt to climate change (McKeon and Howden 1991)
- 1996: explicit concern about robustness of SCF signals and their implication for adaptation (Gifford et al. 1996)
- ……
- ……
- 2014: critical reflection on the benefits and risks associated with using SCF as ‘telescopes’ into the future (Rickards et al. 2014)

A critical review

- Critique is not of the seasonal forecasts themselves but of the way that they are sometimes used and presented

Uncertain

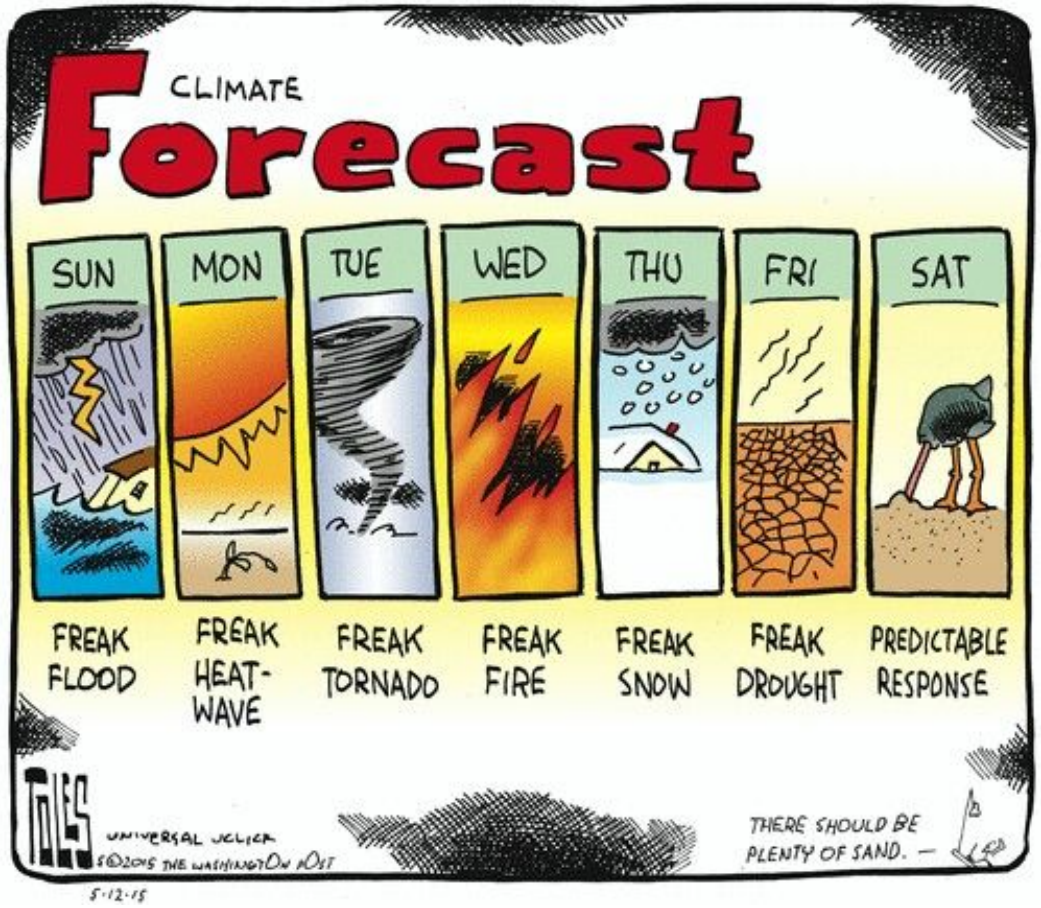
- Forecasts uncertain via data limitations, model biases and gaps, internal variability, climate change etc
- Often uncertain how uncertain the forecasts are (and this can vary by time, location, forecast duration)
- Challenges in communicating the forecasts and uncertainties



Rickards et al. 2014

Uncertain

- Deterministic interpretation of probabilistic information leading to disengagement

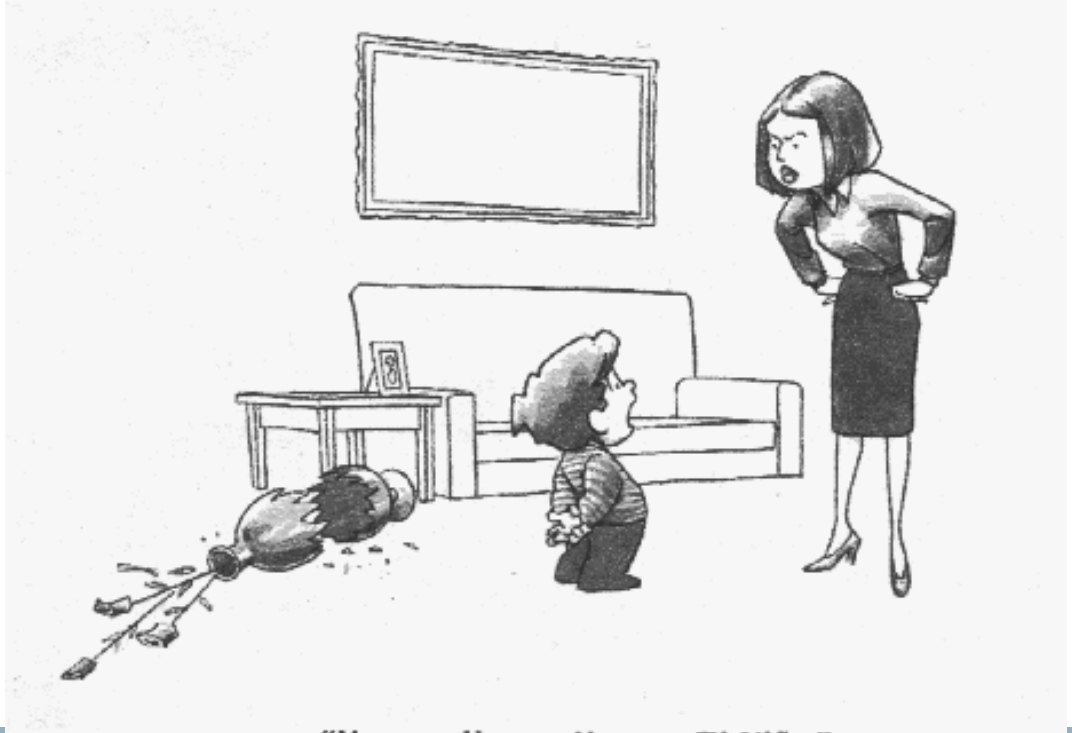


- Issues around trust in the forecast producers

Rickards et al. 2014

Insufficient

- Access to seasonal climate information is necessary but not sufficient for climate adaptation
  - only one of many sources of information and knowledge
- Seasonal climate only one of many things to blame !



Rickards et al. 2014

Insufficient

- Personal, experiential knowledge is not ‘replaceable’, so we need ways to recalibrate existing understanding of decision-makers
  - increasingly so as the climate changes
- The exploratory and educational role of SCF may be a key benefit
  - rather than (or in addition to) the usual focus on decision-support

Distracting

- Focussing on SCF may limit engagement with other approaches such as scenario exploration which can generate imaginative and valuable adaptation ideas
- The individualistic focus of many SCF projects limits the embedding within the social and institutional processes where larger-scale decisions are made
- The technical focus often limits addressing ethical issues

Rickards et al. 2014, Lacey et al. 2015

Distracting

- Some other processes (e.g. scenarios) aim to open up the range of possibilities whereas often the objective of SCF is to narrow them down
- Over-reliance on SCFs at the expense of other forms of knowledge and more systemic perspectives risks maladaptation by locking-in to approaches that are less and less viable instead of moving to alternatives

Rickards et al. 2014

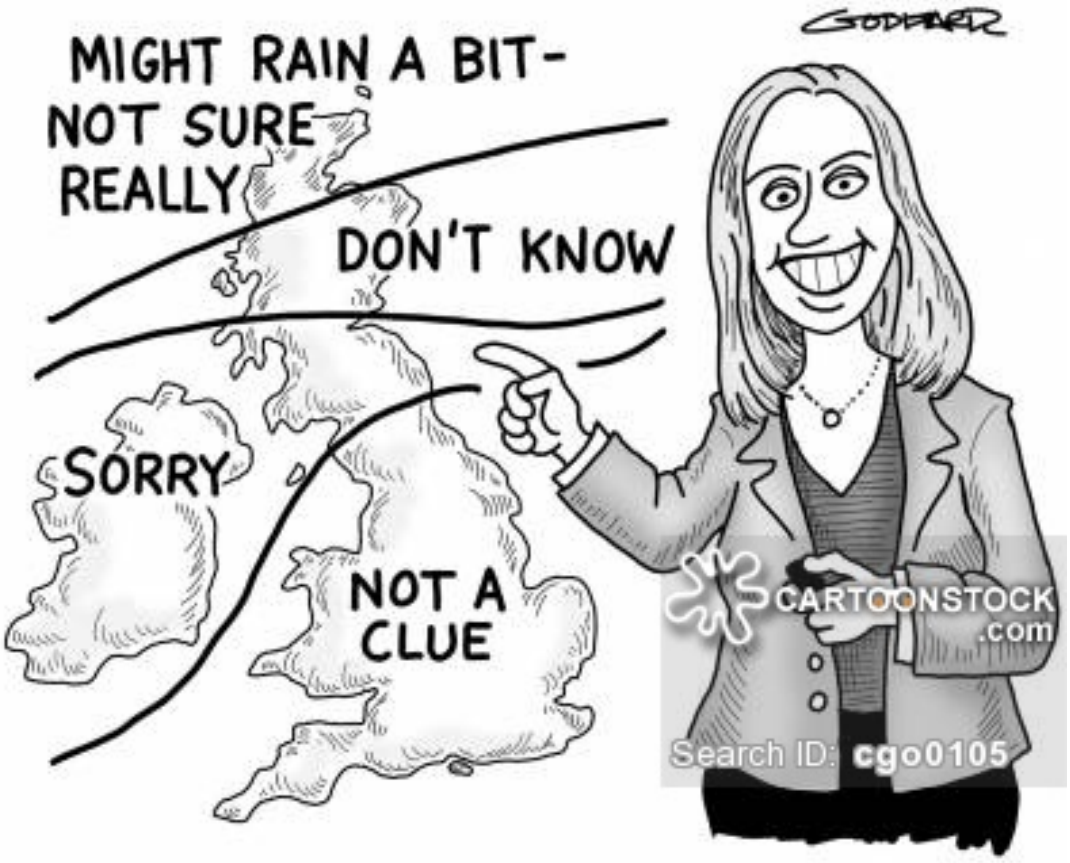
Misleading

- Challenge of including climate change within both statistical and dynamic climate forecasts
- Focussing on what the forecasts can deliver, not what may be important

Rickards et al. 2014

Misleading

- Often forecasts are provided even if the skill is low. Good practice is for forecasters to say when they don't know



Honest weather forecasting.

Rickards et al. 2014

Unnecessary

- Delay decision-making whilst better forecasts are developed (across a season as well as longer periods)
- The very existence of forecasts can imply the **necessity** of using them for decision-making
- Psychologically and institutionally reliance on forecast information (*vs* ignorance is bliss ?)

Rickards et al. 2014

Unnecessary

- Enhance capacity to make decisions under uncertainty (‘robust’ decision-making, ‘no-regrets’, safety-margins, real-options etc)
- Risk-spreading, diversification

Lempert and Schlesinger 2000, Hallegatte 2009, Dessai et al. 2009

Divisive

- Potential for SCF to increase inequalities, leading to perverse outcomes
- Often the focus is on human capital and individual well-being and action but this tends to omit social capital and coordinated, collective responses
- Potential perverse outcomes if convergent decision-maker behaviour intersects with market or other forces
  - potential for counter-cyclical responses which can themselves alienate

Rickards et al. 2014

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Summary

- The use of SCFs as ‘stepping-stones’ to adapt to climate change has a range of potential advantages and disadvantages
- Limitations to the use of SCFs for adaptation include issues around uncertainty, insufficiency, distraction, misdirection and being unnecessary and divisive
- In particular, over-reliance on SCFs at the expense of other forms of knowledge and more systematic and transformative perspectives poses risks of maladaptation
- Longitudinal studies of SCF use and ways to increase their effectiveness as a boundary object are warranted

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Thankyou

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