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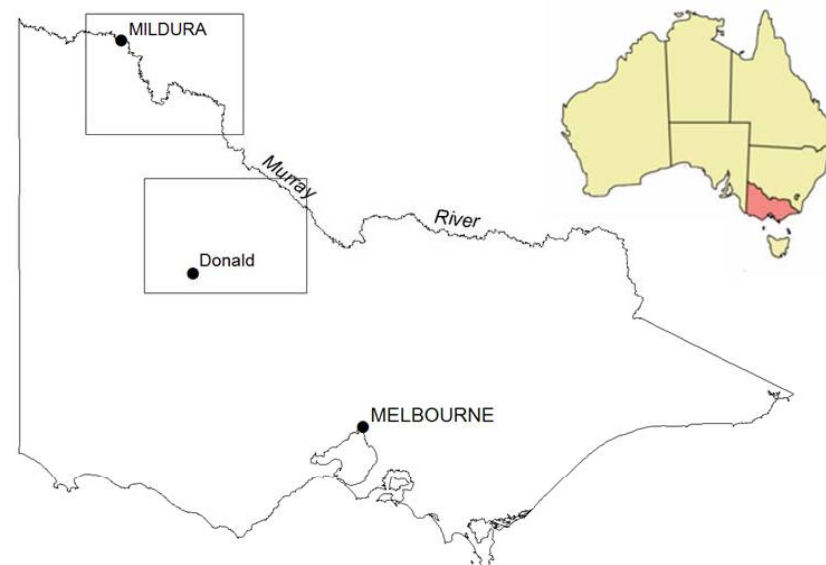
DROUGHT AND THE FUTURE OF RURAL COMMUNITIES: IMPACTS AND ADAPTATION IN REGIONAL VICTORIA, AUSTRALIA

**Anthony S. Kiem, Louise E. Askew, Meg Sherval,
Danielle C. Verdon-Kidd, Craig Clifton, Emma Austin,
Pauline M. McGuirk, Helen Berry**



Introduction

- Two case studies: Mildura and Donald
- Consider the:
 - impacts of drought on water supply and availability
 - social and economic impacts of drought
 - past and present adaptation measures used as a result of knowledge and experience gained from previous droughts
 - future adaptation measures required to deal with projected increase to frequency and magnitude of drought events



Location of the two case study towns

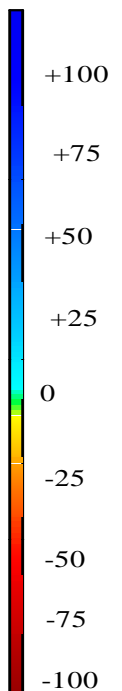
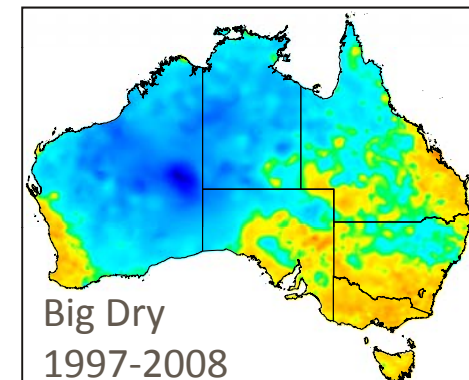
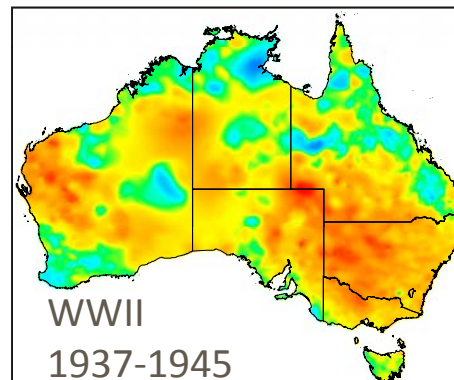
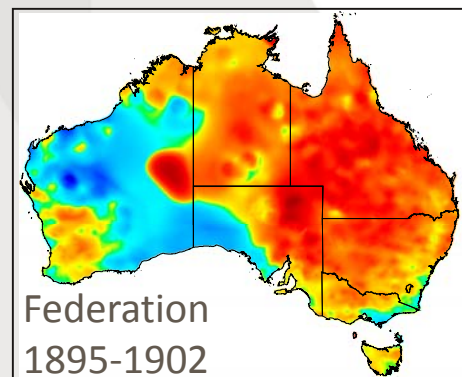
Introduction

- **Historical climate analysis** performed using observed rain, temp and evap data from the Bureau of Meteorology
- **Picture of future climate** produced based on literature review, CSIRO Climate Change in Aust website etc.
- **~30 one-on-one interviews** undertaken as ‘conversations with a purpose’ with stakeholders representing local and regional organisations, government agencies, local councils, private business, the community and farming enterprises
- **Scenario planning workshops** – targeted participants
 - What are the future challenges?
 - What are the future opportunities?
 - What actions are required to be able to adapt?
 - Limitations and/or barriers to adaptation also briefly covered...

Historical frequency or scale of disaster

- Drought is a familiar and influential part of Australia
 - driest inhabited continent and is characterised by one of the world's most variable rainfalls
- **But all droughts are different** -- Landscape has been shaped by successive droughts of varying lengths and magnitudes that have simultaneously affected patterns of settlement, migration, agriculture and production
- Awareness that drought is not an occasional one-off event but a normal part of variability in the ocean-atmospheric system that drives Australia's climate

% change in annual rain (1997-2008) compared to the long term mean (1900-2008) – from Verdon-Kidd and Kiem (2009)



Characteristics of event which made it particularly severe/damaging

- This drought different to Federation and WWII
 - Climatically – seasonally and in the way rain fell when it occurred
 - Demand on system
 - Social situation and changing demographics (aging and declining population)
 - Global economic situation
 - For Donald, collapse of AWB “single desk”
 - For Mildura, “small block” exit grants
- Traditional policy approach (i.e. ‘disaster management’) is flawed
 - Failure to recognise that future dryness will occur
 - Drought viewed as a short-term crisis

Existing resilience and role of institutions in increasing or reducing resilience?

- Farmers are known to be resilient
 - To drought
 - To global finance ups and downs (e.g. low prices)
 - To changes to policy (e.g. loss of AWB)
 - To ever changing rules (and who makes the rules) re water allocations, trading etc
 - **THIS DROUGHT HAD ALL THESE AT ONCE!!**

Also in 2010: Floods, locusts, floods again...

Strong wish that last 15yrs of struggle not be forgotten when drought “finishes”

- Requires ongoing, consistent and proactive (as opposed to short-term, changing and responsive) drought, water, and agricultural policy

What (if any) adaptation occurred after the event? Barriers to adaptation?

- Ongoing adaptation....very ad hoc...
- Mildura: irrigation allocations, Exit Grants, EC
- Donald: migration from town, Exit Grants, EC
- Diversifying economies: solar/wind energy, manufacturing, tree change tourism
- Innovation through technology, new crops etc
- Barriers or limits to adaptation...

Limits or barriers to adaptation...

➤ **What can be done about reducing or better quantifying uncertainty?**

- Climate drivers and impacts
- Policy and who controls the water
- Economics
 - Australia in context of global economy
 - Collapse of AWB (i.e. single desk) a major disaster!!
 - Undervaluation of raw products and the role of “farmers” as a whole

➤ **Social/environmental consequences of water trading – past, present, future??**

- Again, who controls who gets the water?
- Implications and limitations of market based water allocation? – ongoing project!!

➤ **Communication**

- Science \Leftrightarrow government agencies \Leftrightarrow small communities currently not very effective

➤ **Other non-climate related issues**

- Declining and aging population in small towns
- Shift in thinking re “best” use of land
 - \$\$ for land for ag –v– \$\$ if used for mining, wind farms, solar farms etc

Conclusions

- 1. There is great advantage in furthering comparative, case-study based research into climate change impacts and adaptation**
- 2. More certainty, or at least better quantified uncertainty, is required with respect to both commodity prices and short (i.e. seasonal) and long-term (i.e. decades from now) forecasts of climate impacts**
 - Though important to note that this will not happen soon.
 - More urgent objective is to quantify the uncertainties and develop tools to support decision making under uncertainty so as to build resilience (i.e. ability to reconfigure without crucial loss)
- 3. Necessary to reframe our historical understandings of farms & farming communities (including revaluation of farming enterprise)**
- 4. Future research requires a coordinated and respectful approach in working with drought-affected communities**
- 5. Need ongoing, consistent and proactive (as opposed to short-term, changing and responsive) drought, water, and agricultural policy**

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IMPORTANT

- **a lot** of drought and climate change adaptation research
- well documented facts, key themes and recommendations continue to emerge
- little evidence of effective implementation (i.e. tangible outcomes)
- investigation required into why documented solutions & priorities not implemented
- what are the barriers that are preventing implementation?
- how can these barriers can be overcome?



Thanks

- Questions...