

PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY

19th BIENNIAL CONFERENCE

Official publication of The Australian Rangeland Society

Copyright and Photocopying

© The Australian Rangeland Society 2017. All rights reserved.

For non-personal use, no part of this item may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission of the Australian Rangeland Society and of the author (or the organisation they work or have worked for). Permission of the Australian Rangeland Society for photocopying of articles for non-personal use may be obtained from the Secretary who can be contacted at the email address, secretary@austrangesoc.com.au

For personal use, temporary copies necessary to browse this site on screen may be made and a single copy of an article may be downloaded or printed for research or personal use, but no changes are to be made to any of the material. This copyright notice is not to be removed from the front of the article.

All efforts have been made by the Australian Rangeland Society to contact the authors. If you believe your copyright has been breached please notify us immediately and we will remove the offending material from our website.

Form of Reference

The reference for this article should be in this general form:

Author family name, initials (year). Title. In: Proceedings of the 19th Australian Rangeland Society Biennial Conference. Pages. (Australian Rangeland Society: Australia).

For example:

Bastin, G., Sparrow, A., Scarth, P., Gill, T., Barnetson, J. and Staben, G. (2015). Are we there yet? Tracking state and change in Australia's rangelands. In: 'Innovation in the Rangelands. Proceedings of the 18th Australian Rangeland Society Biennial Conference, Alice Springs'. (Ed. M.H. Friedel) 5 pages. (Australian Rangeland Society: Parkside, SA).

Disclaimer

The Australian Rangeland Society and Editors cannot be held responsible for errors or any consequences arising from the use of information obtained in this article or in the Proceedings of the Australian Rangeland Society Biennial Conferences. The views and opinions expressed do not necessarily reflect those of the Australian Rangeland Society and Editors, neither does the publication of advertisements constitute any endorsement by the Australian Rangeland Society and Editors of the products.



The Australian Rangeland Society

“The climate has always been changing”: Perspectives of climate change in far west NSW

Emily Berry¹ and Graciela Metternicht²

1 School of Biological, Earth and Environmental Sciences, UNSW Sydney, emilyberry1@gmail.com

2 School of Biological, Earth and Environmental Sciences, PANGEA Centre, UNSW Sydney

Keywords

Climate change adaptation, land degradation, rangeland community, rangeland management, sustainable land management, stewardship

Abstract

While scientific studies and literature link anthropogenic climate change to land degradation as a cause and consequence, the connection may not be so clear for local rangelands communities. We interviewed 18 stakeholders in the far west of New South Wales about their perspectives on environmental issues and sustainable land management. Few participants were concerned about the potential effects of climate change on the region. By perceiving widespread changes over a long time frame, industrialised human impacts are seen as minimal and of little impact in comparison to the idea of a natural climatic cycle. Nonetheless, there were multiple observations of confusing or unexpected current climatic patterns, although their observers were unwilling to attribute their cause to climate change.

Many participants described their rangeland management styles as adaptive to climatic fluctuations, regardless of the reasons for its variations, suggesting that ‘believing in’ climate change is unnecessary for land managers in this region to respond appropriately to its threats. Many also expressed willingness to partake in climate-based initiatives, if given private incentives. Sustainability was seen as pragmatic, resourceful and mainstream, with intergenerational concerns being a strong motivator for sustainable land management. Such results signify a need to better understand local land managers’ perspectives in the design and implementation of climate change adaptation and mitigation strategies.

Introduction

In Australia, impacts of climate change are predicted to disproportionately affect rangeland communities, particularly through increased droughts, floods, and associated financial debts (Hughes *et al.*, 2016). Predicted changes for the far west of NSW indicate that an increase in average and severe fire weather, a decrease of rainfall in spring and increase in autumn, and approximately 12 more ‘hot days’ (days above 35°C) on average by 2030 (NSW OEH, 2014). The predictions suggest that pastoralists should anticipate changes to animal and plant migrations, erosion patterns, algal blooms, heat stress in livestock, and an increase in range, size and density of woody shrubs (Gepp, 2012).

Climate change and land degradation have a complex relationship as both causes and consequences of the other (Cowie *et al.*, 2011), but they are often studied separately and without consideration of social contexts (Reed & Stringer, 2015). This paper reports on climate change as part of a larger investigation into local perspectives of land degradation in far west NSW. We aimed to identify potential mismatches in local and scientific understandings and to direct the design of future engagement. We adopted a participatory approach relying on stakeholders’ perceptions, recognising that a negative process of degradation is contextual (Warren, 2002), dependent on the moral values and various interests of its observers (Hobbs, 2016), and land managers are intimately reflective of system functions and sensitive to changes (Whitfield & Reed, 2012).

Methods

The far west case study area is in the Western region of NSW (Figure 1). Predominant land uses include grazing (sheep, cattle and goats), metal ore mining, tourism, conservation, and some new renewable energy. Among other characteristics, the region’s climate variability, sparse population and remoteness displays a similarity to outback Australia’s hypothesised ‘desert syndrome’ (Stafford

Smith, 2008). Its high non-annual climatic variability and reliance on volatile export markets mean that risk and uncertainty are particular considerations (Greiner & Gregg, 2011).

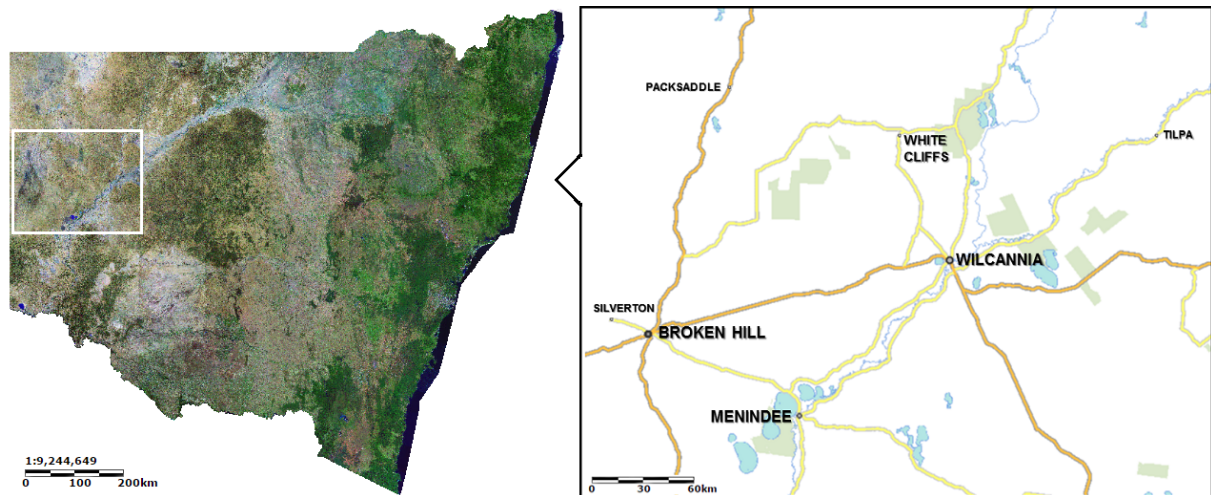


Figure 1. The far west NSW case study area (maps modified from the Vegetation Information System Map Catalogue provided by the NSW Office of Environment and Heritage).

Interviews, in the form of ‘conversations with a purpose’ (Mason, 2002), allowed a flexible approach and appropriate context. In October 2015, we interviewed 18 participants strategically selected through a snowballing technique: 10 pastoralists (P01-P10), 4 government employees in different levels (G01-G04), and 4 local residents (one indigenous and three opal miners, L01-L04). Various stakeholders were self-excluded. Guided by grounded theory, QSR NVivo 10 was used during the analytical process.

Results and discussion

Perspectives on climate change

Several participants framed the constant fluctuations of the climate as a natural cycle (G01: “I’m sure things are cyclic, things come and go”; G03: “It’s a cycle. That’s why when they say climate change, I don’t take notice of that...”). Consequently, participants tended to minimise the impacts made by people since the industrial revolution (L02: “climate’s been changing out here for a long time regardless”; P03: “we may increase it, we may speed it up a bit, but my view is ‘well, climate will change’”; L04: “climate has always been changing, and if it didn’t change, we couldn’t exist”).

One pastoralist reflected that natural changes in the climate are “an ongoing process of the globe” causing mass species evolutions and extinctions over time, “so I suppose the human species will probably come and go too...” (P04). Such responses align with those found by Connor and Higginbotham (2013), who argue that the large-scale perception of climatic cycles places people within nature. While the respondents perceive themselves to hold control over land management, the climate and weather are seen as ultimately uncontrollable.

Although climate change is a statistical phenomenon that is not well suited to personal observation and evaluation (Weber, 2010), stakeholders’ responses to climate change highlighted the importance of observable and experiential knowledge. This informed their unconcerned stance towards the effects of climate change to them (L03: “I’ve been here for 50 years and I haven’t seen any evidence of it at all”; P03: “my father-in-law who’s been around for a very, very long time tells me that it changes every 15-20 years anyway”). Connor and Higginbotham (2013) found that rural Australians in particular rely on their experiences of droughts and changing seasonal patterns to back up their positions towards climate change, without detecting variations beyond the normal vagaries of the climate. Warnings of more ‘hot days’, as calculated as days above 35°C (NSW OEH, 2014), appeared laughably minimal compared to the regular summer extremes of days over 50°C.

Those unwilling to accept the anthropogenic frame of climate change labelled different natural processes as ‘weird’ or ‘strange’. For example, P07: “I’m not a great believer in global warming as such, because it doesn’t seem to really be happening... [but] the last 15 years here has been as weird as anything else. We seem to be going from a drought to a flood backwards and forwards... there’s no

continuity.” This response confirms Weber’s (2010) argument that direct personal experiences need to be shown as causally connected to climate change in order to raise concerns among the affected. The stakeholders’ detections of different patterns may be an ‘entry point’ into shifting notions about climate change, even if they are initially reluctant to draw the links between what they perceive and what they believe.

Perspectives on action to respond to climate change

A prevalent idea was that there are more immediate issues: *“I think probably climate change is in the back of people’s minds but ... people have got enough to worry about, without being bombarded with stuff about climate change”* (P03). The Climate Council also describes existing stresses as a barrier to climate change adaptation in rural communities (Hughes *et al.*, 2016).

One pastoralist rationalised climate action despite her beliefs: *“I’m probably not a ‘pure’ climate change sceptic... I think it’s a cycle... [but] I think that having renewables is an excellent idea... The things that they do, to try and fix what they perceive as climate change, in some ways, are good for the planet anyway so why not do it”* (P08). Others (L04, P03, P09) were less supportive of climate action because they felt victimised by blame unfairly targeted towards country people (also see Donnelly *et al.*, 2009), while urban people and big business were seen as bigger culprits.

Concern about climate change might not need to be a strong motivator for appropriate action. Mazur *et al.* (2013) found little difference between the climate mitigation actions undertaken by rural Victorians who were variously concerned, sceptical or unsure about anthropogenic climate change. Willingness to act may be restricted by other constraints such as lack of resources, skills or social acceptance (Waudby *et al.*, 2012). Rather than attempting to shift people’s ideological positions towards climate change, Kuehne (2014) suggests that other environmental and economic benefits from responses to climate change may be sufficient, and that other related challenges may prompt appropriate action.

Being prepared for short term climactic variability and preventing land degradation through sustainable land management means that land managers are “better prepared for long term climate change” (Reed & Stringer, 2015, p. 70). Among other mitigation and adaptation actions for pastoralists in the far west region, Gepp recommends improving groundcover, managing pests and weeds, selective breeding and updating animal husbandry practices – in effect, “managing existing stressors”, while noting that these practices are “within the means and abilities of landholders and supporting agencies” (2012, p. 7). The far west stakeholders’ responses to such stressors show that these are essential and normal considerations (discussed in more detail in Berry, 2017). Sustainability in land management was not a challenging concept; it is seen as “pragmatism” (P07) and “common sense” (L03) that environmental health and farming livelihoods are necessarily connected (P10, G01, G02). Ideas of stewardship (such as P09: *“we are the caretakers”*) often complemented with inter-generational motivations to manage the land carefully (P03, P04, P08).

One pastoralist said that he is *“not concerned about [the environment] at all. It’s just a matter of managing with the climatic seasons that come to us... That’s all you can do, just work with the climate”* (P04). Living with climate change means adapting to extremes, and there is already evidence that Australian primary producers have “a strong culture of adaptation” (Donnelly *et al.*, 2009, p. 24). Indeed, Nelson *et al.* (2010) show that although the far west region is projected to be among the highest exposed to climate variability and change in terms of pasture growth, it is also less vulnerable because of a complex set of environmental, social and economic reasons, including its developed adaptation to the climate.

Existing adaptive management in the far west may help land managers to face climate change, but the rangelands community has aspects of vulnerability. The waning of the Landcare movement and the shifting social environment (rising absenteeism and ageing population) may weaken the region’s social resilience. Predicted changes may also be outside of lived experience for European-style land management in the far west. Paleo-climate records of the region indicate that, since rainfall has been instrumentally measured (in the last 150 years), drought and flood risks have been relatively stable compared to a wider context of an even more variable climate (Ho *et al.*, 2015; Tozer *et al.*, 2016). Hence there is a role for continued governance, engagement and scientific input to strengthen the region’s climate resilience.

Conclusion

Our research in far west NSW shows that the predominant idea of the climate's 'natural cycle' is engrained in the current land managers' perspectives. Responses confounded climate variability with climate change, leading to a general lack of concern. Existing adaptation to natural climate variability has accustomed land managers to responsive management practices. Land managers also exhibited extensive knowledge of their country and practices appropriate to environmental constraints. However, the local community requires more tailored scientific information to prepare for potentially overwhelming circumstances. Engagement on climate change adaptation and sustainable land management should specify the benefits of involvement in ways that are more meaningful to local people.

References

- Berry, E. J. (2017). *Who cares about land degradation neutrality? Exploring the rift between global discourses and local perspectives in far west New South Wales*. (Master of Philosophy), The University of New South Wales.
- Connor, L. H., and Higginbotham, N. (2013). "Natural cycles" in lay understandings of climate change. *Global Environmental Change* **23**(6), 1852-1861. doi:10.1016/j.gloenvcha.2013.07.002
- Cowie, A. L., Penman, T. D., Gorissen, L., Winslow, M. D., Lehmann, J., Tyrrell, T. D., Twomlow, S., Wilkes, A., Lal, R., Jones, J. W., Paulsch, A., Kellner, K., and Akhtar-Schuster, M. (2011). Towards sustainable land management in the drylands: Scientific connections in monitoring and assessing dryland degradation, climate change and biodiversity. *Land Degradation & Development* **22**(2), 248-260. doi: 10.1002/ldr.1086
- Donnelly, D., Mercer, R., Dickson, J., and Wu, E. (2009). Australia's farming future final market research report: Understanding behaviours, attitudes and preferences relating to climate change. Sydney: Instinct and Reason. Prepared for Australian Government Department of Agriculture, Fisheries and Forestry.
- Gepp, K. (2012). What will climate change really mean to graziers in the Western Catchment of NSW. *Proceedings of the Australian Rangeland Society Biennial Conference* (pp. 8). Australian Rangeland Society.
- Greiner, R., and Gregg, D. (2011). Farmers' intrinsic motivations, barriers to the adoption of conservation practices and effectiveness of policy instruments: Empirical evidence from northern Australia. *Land Use Policy* **28**(1), 257-265. doi:10.1016/j.landusepol.2010.06.006
- Ho, M., Kiem, A. S., and Verdon-Kidd, D. C. (2015). A paleoclimate rainfall reconstruction in the Murray-Darling Basin (MDB), Australia: 1. Evaluation of different paleoclimate archives, rainfall networks, and reconstruction techniques. *Water Resources Research* **51**(10), 8362-8379. doi:10.1002/2015WR017059
- Hobbs, R. J. (2016). Degraded or just different? Perceptions and value judgements in restoration decisions. *Restoration Ecology* **24**(2), 153-158. doi: 10.1111/rec.12336
- Hughes, L., Rickards, L., Steffen, W., Stock, P., and Rice, M. (2016). On the frontline: Climate change and rural communities (pp. 96): Climate Council of Australia Ltd.
- Kuehne, G. (2014). How do farmers' climate change beliefs affect adaptation to climate change? *Society & Natural Resources* **27**(5), 492-506. doi:10.1080/08941920.2013.861565
- Mason, J. (2002). *Qualitative Researching*. London: Sage Publications.
- Mazur, N., Curtis, A., and Rogers, M. (2013). Do you see what I see? Rural landholders' belief in climate change. *Society & Natural Resources* **26**(1), 75-85. doi:10.1080/08941920.2012.686650
- Nelson, R., Kokic, P., Crimp, S., Martin, P., Meinke, H., Howden, S. M., de Voil, P., and Nidumolu, U. (2010). The vulnerability of Australian rural communities to climate variability and change: Part II—Integrating impacts with adaptive capacity. *Environmental Science & Policy* **13**(1), 18-27. doi:10.1016/j.envsci.2009.09.006
- NSW OEH. (2014). Far west climate change snapshot: State of New South Wales and Office of Environment and Heritage. Available at: <http://climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/Climate-projections-for-your-region/Far-West-Climate-Change-Downloads> [<https://perma.cc/3UAP-6626>] (accessed 30 September 2016)
- Reed, M. S., and Stringer, L. C. (2015). Climate change and desertification: Anticipating, assessing and adapting to future change in drylands. *Impulse Report for the 3rd UNCCD Scientific Conference*. Cancún, Mexico. Available at: http://www.unccd.int/en/programmes/Science/Conferences/Documents/3sc_unccd_impulse-report.pdf [<https://perma.cc/WFM8-JJXX>] (accessed 30 September 2016)

- Stafford Smith, M. (2008). The 'desert syndrome' – causally-linked factors that characterise outback Australia. *The Rangeland Journal* **30**, 3-14. doi: 10.1071/RJ07063
- Tozer, C. R., Vance, T. R., Roberts, J. L., Kiem, A. S., Curran, M. A. J., and Moy, A. D. (2016). An ice core derived 1013-year catchment-scale annual rainfall reconstruction in subtropical eastern Australia. *Hydrology and Earth System Sciences* **20(5)**, 1703-1717. doi:10.5194/hess-20-1703-2016
- Warren, A. (2002). Land degradation is contextual. *Land Degradation & Development* **13(6)**, 449-459. doi:10.1002/ldr.532
- Waudby, H. P., Petit, S., and Robinson, G. (2012). Pastoralists' perceptions of biodiversity and land management strategies in the arid Stony Plains region of South Australia: Implications for policy makers. *Journal of Environmental Management* **112**, 96-103. doi:10.1016/j.jenvman.2012.07.012
- Weber, E. U. (2010). What shapes perceptions of climate change? *Wiley Interdisciplinary Reviews: Climate Change* **1(3)**, 332-342. doi:10.1002/wcc.41
- Whitfield, S., and Reed, M. S. (2012). Participatory environmental assessment in drylands: Introducing a new approach. *Journal of Arid Environments* **77**, 1-10. doi:10.1016/j.jaridenv.2011.09.015