Climate Change Adaptation Research Grants Program
- Settlements & Infrastructure Projects

Project title:
Australia's Country Towns 2050: What will a Climate Adapted Settlement Pattern Look Like?.

Principal investigators:	Professor Andrew Beer
Lead organisation:	University of Adelaide

Objectives:
This project has four key objectives:

1. the project will test two hypotheses: (i) that many inland rural & remote communities are vulnerable to the primary & secondary impacts of climate change & that this varies by location, industry structure, environment, & remoteness; & (ii) that public sector & community planning & action can reduce the impacts of climate change on the sustainability of settlements & that some forms of intervention will be more effective than others.

2. it sets out to inform governments, communities & industry about inland settlement patterns in a climate change adapted rural & regional Australia & thereby provide an evidence base that will assist decision makers & contribute to better policies at the national, state, local & community levels.

3. it will shed light on the sets of processes - environmental, social, economic & demographic - that will reshape Australia's rural & regional settlement pattern as a consequence of global warming. The project recognises that non-metropolitan Australia will be greatly affected by climate change in ways that differ greatly from the capital cities. Key changes will include shifts in agricultural productivity, the impact of extreme weather events, changing local environments & the diminution of resources, including major river systems. These ecologically-driven changes will interact with long term demographic, economic & social shifts to produce complex outcomes. One of the fundamental goals of this project is to develop a more systematic understanding of the consequences of climate change on inland country towns & other settlements across rural & regional Australia.

4. the research seeks to contribute to economically & socially vibrant communities in rural, regional & remote Australia by developing a suite of tools that assist policy makers evaluate the probable impact of climate change on both individual communities & groups of settlements, while at the same time highlighting effective strategies that can be implemented by individual communities & settlements.

Project design & methods:
Understanding the impact of climate change on the settlement pattern of rural & regional Australia presents significant conceptual challenges. It is critical we ensure that the most robust methods are employed in order to guarantee the quality of the research & therefore the advice provided to government & the broader Australian community. For this reason, the project will use a multi methods approach, with each component of the research contributing knowledge that is valuable in its own right, as well as advancing the overall research objectives. The project has been designed to shed light on the two key hypotheses within this project:

a. that many inland rural & remote communities are vulnerable to the primary & secondary impacts of climate change & that this varies by location, industry structure, environment, & remoteness.

b. that public sector & community planning & action can reduce the impacts of climate change on the sustainability of a settlement & that some forms of intervention will be more effective than others;

The work will be undertaken in seven stages, & will produce three main outputs: It will also make use of a User Group/Reference Group that will meet via teleconference five times during the project.

Stage 1. Collection & analysis of Census & other relevant data sets to identify the large scale trends affecting the settlement pattern in rural & regional Australia & vulnerability to climate change. Key indicators include population change, labour force by industry, age profile, educational attainment, & workforce skills. These data will be collected & analysed at the ABS's Urban Centres & Localities level to produce a fine-grained picture of change & construct a composite index of vulnerability to climate change for all of inland Australia. User group teleconference 1 will occur prior to this stage of the research, during the project inception phase.

Stage 2. Collection & analysis of 'grey' literature produced by local governments, planning departments, state & Australian government departments & non government organisations on the potential & extant strategies being used across rural & regional Australia to prepare for, & adapt to, climate change. This analysis will be supplemented by the team's considerable knowledge of the international & national academic literature in this area.

Stage 3. Collect data from relevant sources - government bureaux, industry associations etc - on the likely impact of climate change on individual industries in order to assess the potential impact of their decline or growth on Australia's rural & regional settlement system. Clearly country towns & regional centres dependent on industries vulnerable to climate change are likely to be more affected by those centres that rely on less exposed sectors. These likely impacts need to be understood & quantified for inclusion in the composite index of vulnerability. *User group teleconference 2 will follow the completion of stages 1-3.*

Output 1: Report on targeted literature & data review: Impacts of climate change on industry, regional economies & community & policy responses.

Stage 4. Refinement of the index of vulnerability for all UCLs in rural & regional Australia & analysis of the outcomes using a range of statistical techniques including hierarchical cluster analysis to identify groups of similarly vulnerable or resilient settlements, as well as regression analysis to identify causative processes. Stage 4 will be used to quantify the level of vulnerability for individual settlements & groups of centres. The analysis will employ sensitivity analysis to examine the relative influence of economic, social & environmental factors on the final output. The vulnerability index will build upon previous work on Community Opportunity & Vulnerability in Australia's Cities & Towns, using significant conceptual & methodological innovation to deal with the specifics of climate change & adaptation.

Stage 5. Identification of 5 case study settlements for further analysis. The final selection of inland settlements for further investigation will be informed by the outcomes of the previous stages - especially Stage 4 - as well as settlement size, degree of remoteness & economic base. However, preliminary analysis of social, economic & institutional data suggest that the case studies will be Waikerie in SA; Alice Springs in the NT; Horsham in Vic; Junee in NSW; & Longreach in Qld. Detailed empirical work will then be undertaken in each of the case study locations, including interviews with decision makers, the collection of data on planning for the primary & secondary impacts of climate change, collection of additional data sets relevant to the study site; & documentation of strategies currently employed to address the impacts of climate change. *User group teleconference 3 to follow this stage*.

Output 2: Report: Insights into climate change adaption in rural & regional settlements.

Stage 6. Application of Delphi analysis using two groups of relevant experts - those knowledgeable on the economic, social & demographic processes that sustain Australia's regional & rural centres, & a second group of Australian climate change experts. The Delphi analysis from the two groups will be used to identify the broader trends affecting rural & regional settlements, including information on the nature, direction & distribution of such impacts. *User group teleconference 4 to follow completion of this stage*

Stage 7. Synthesis of the results & communication of the final results via a report & other media.

Output 3: Final report synthesising findings.