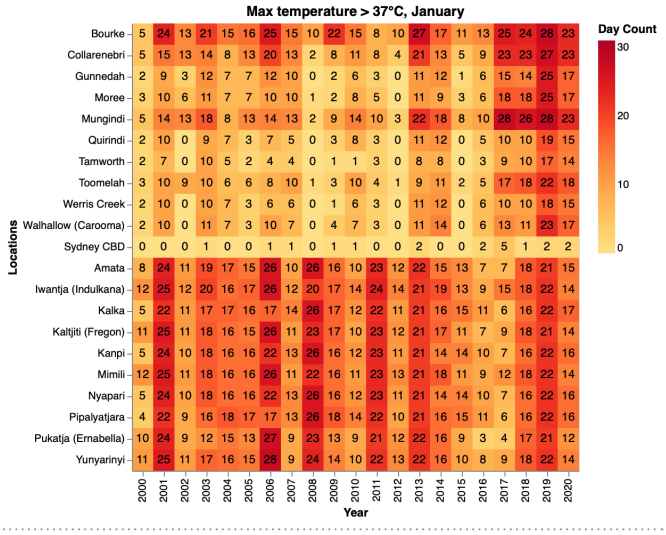
SUSTAINABLE INDIGENOUS HOUSING IN REGIONAL AND REMOTE AUSTRALIA

The climate is warming, with **higher maximum temperatures** sustained for longer periods. Summers are beginning earlier and lasting longer, with higher night-time minimums.

Remote Indigenous communities are disproportionately impacted by climate change.

Indigenous housing in regional and remote Australia is of **mixed quality and age**.

Crowding remains a major issue.



KEY FACTS

71% The majority of Indigenous adults in remote areas **rent from a social housing** provider (2018-19)

The main reasons for health hardware dysfunction are:

74% a lack of **routine maintenance**

19% **poor** initial construction

51% The proportion of Indigenous adults living in **overcrowded households** in very remote areas (2018-19)

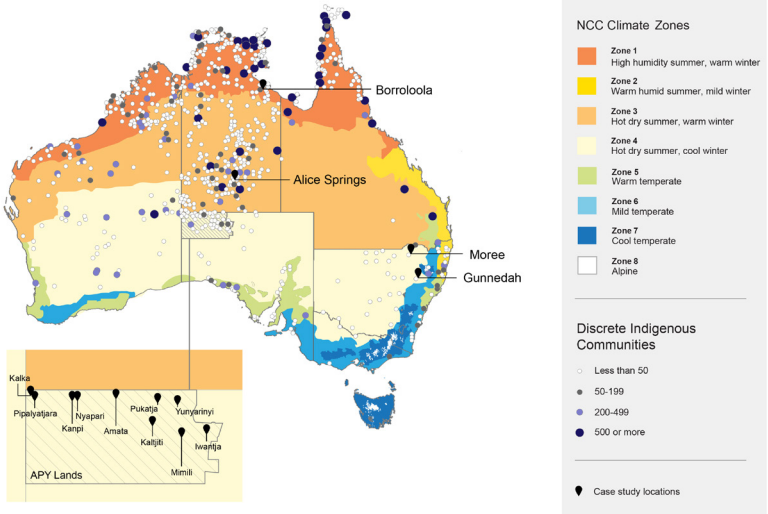
Projections suggest that for Australia, **hot days will become more frequent and hotter** (very high confidence)

https://www.indigenoushpf.gov.au/measures/2-01-housing; http://healthabitat.com; https://www.csiro.au/en/research/environmental-impacts/climate-change/climate-change-information

Government funding for **cyclical and preventative maintenance** is severely limited. This matters because most Indigenous households are in some form of **tenancy arrangement**.

OUR AIM:

We sought to test how well **Indigenous houses perform across the three different Australian climate zones** (1. tropical, 3. arid, and 4. hot/mild) where the majority of discrete Indigenous communities are located, as defined by the Australian Building Codes Board.



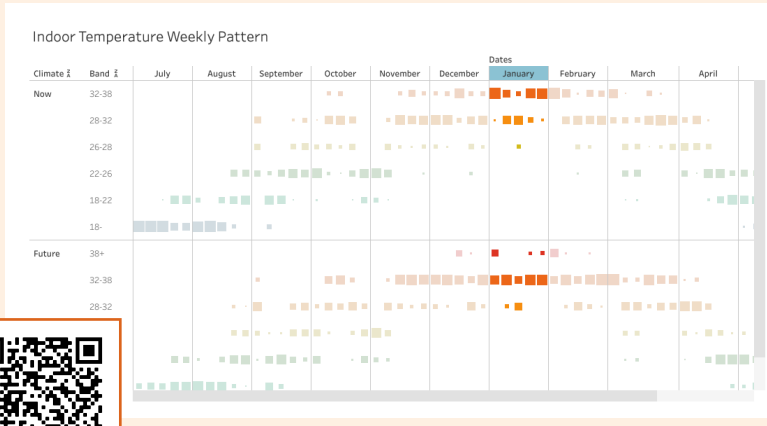
Lea, T., Grealy, L., Moskos, M., Brambilla, A., King, S., Habibis, D., Benedict, R., Phibbs, P., Sun, C. and Torzillo, P. (2021), Sustainable Indigenous housing in regional and remote Australia AHURI Final Report 368, Australian Housing and Urban Research Institute Limited, Melbourne, URL, doi: 10.18408/ahuri7323701.

AHURi

We created a simple housing typology: a **'standard' three bedroom house** of the kind one might find across remote Australia, and an **'improved' three bedroom house**, that has been modified to meet National Construction Code guidelines for the climate zone in question. Using simulation software we modelled for **crowding, cooling systems, energy consumption, and ventilation** for both standard and improved housing designs.

For example, a house with seven residents, a split system air conditioner in the living room, and natural ventilation in the arid climate zone.

HFH Incubator Interactive Housing Performance Dataset

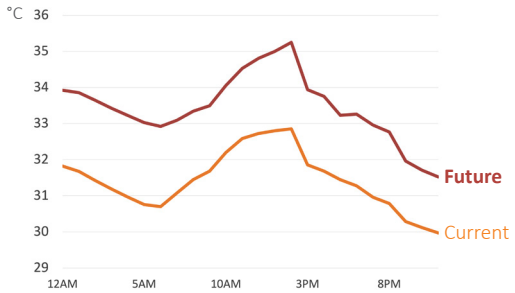


Chao Sun (Sydney Informatics Hub Project Scheme)

CURRENT HOUSE DESIGN

Our modelling showed that, in this scenario, the house sustained **high indoor temperatures throughout the day**.

Temperatures are shown for the scenario: **seven occupants, arid climate, standard design, natural ventilation, split system** (now and future).



Date: 21 Dec

IMPROVED HOUSE DESIGN

The improved house design—built in accordance with current construction recommendations for the climate zones—**at best offers limited gains for indoor temperature**.

The average indoor temperatures remain high. For what lies ahead, **people will need more** from effective retrofitting and improved designs.

Question: Will retrofitting the houses offer a big enough impact? Answer: no

Using conservative climate change projections, our modelling showed that **'improved' house designs** built to current recommendations **will not cope** with an (optimistic) increase of 1.5°C.

MORE RADICAL DESIGN SOLUTIONS ARE NEEDED

What are the solutions? Is it an improved insulation requirement? Underground houses? New designs altogether? This is what Australia needs to excel in answering.

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