

Innovative Urban and Coastal Collaborations in the Australian Region



Professor Barbara Norman
Canberra Urban & Regional Futures
University of Canberra
Mediterranean City 2014
Athens 10 June 2014

Climate change projections for Australia

Sources: The State of the Climate 2014,
IPCC AR5, ACT Climate Change Council



Australian Government
Bureau of Meteorology

Climate scenarios for Australia. Projections are based on our assessment of changes simulated by many climate models from around the world, including Australia.

Annual-average rainfall projections **uncertain in northern Australia**

Frequency and intensity of **extreme daily rainfall** to increase for most regions

Sea-level rise will increase frequency of **extreme sea-level events**

Ocean acidification will continue

Potential long-term decrease in number of tropical cyclones but increase in intensity

Temperatures to rise, with **more hot days** and **fewer cool days**

Extreme fire-weather days to increase in southern Australia, with a longer fire season

Annual-average rainfall to decrease in southern Australia, with an **increase in droughts**

Getting warmer

FINAL DRAFT

IPCC WGII AR5 Chapter 25

Do Not Cite, Quote, or Distribute Prior to Public Release on 31 March 2014

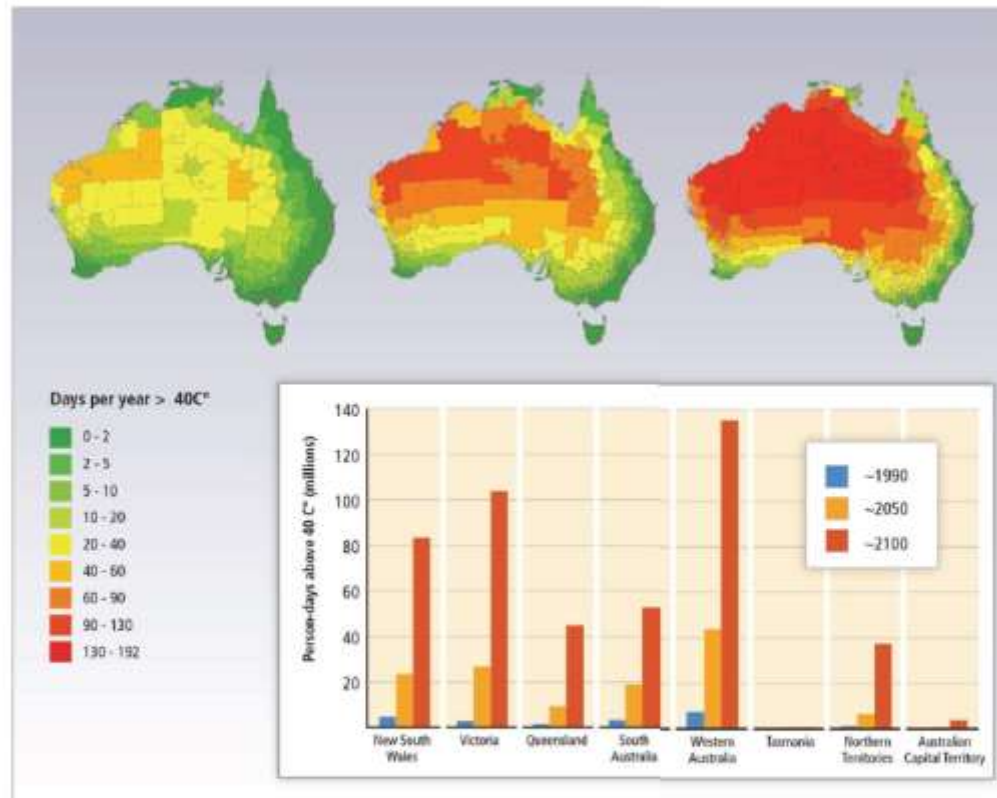
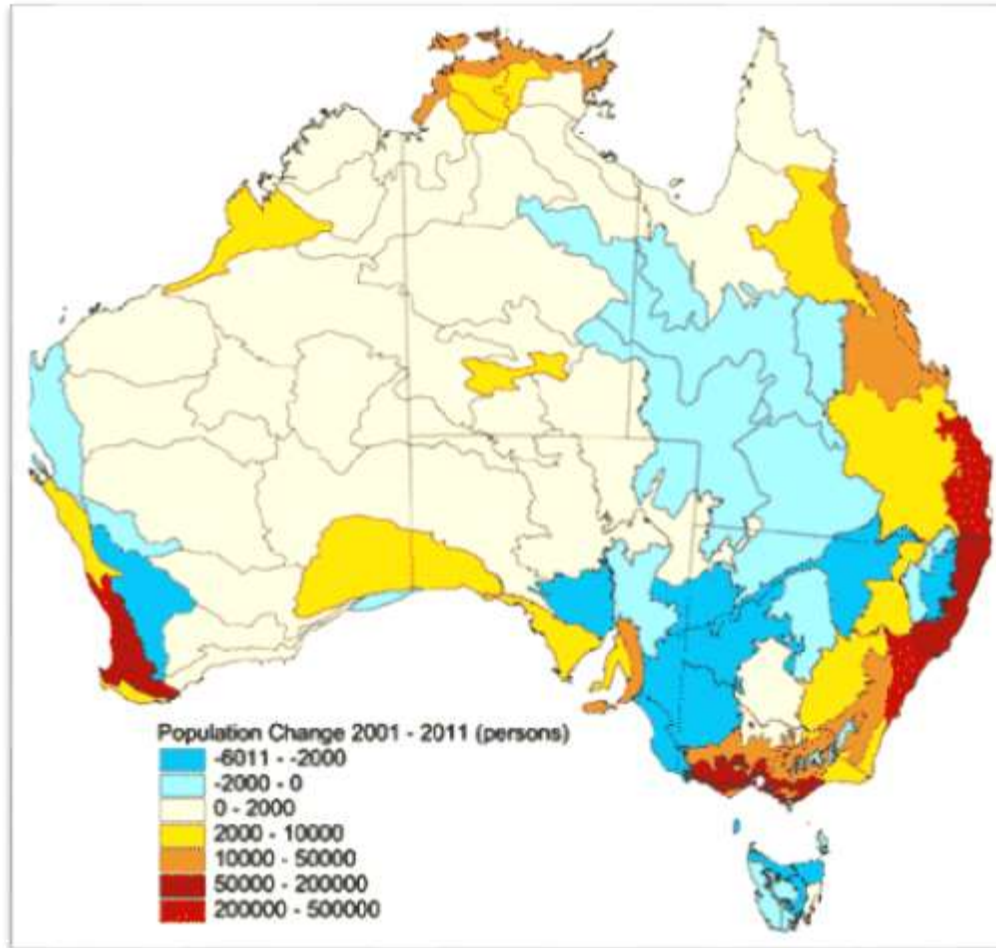
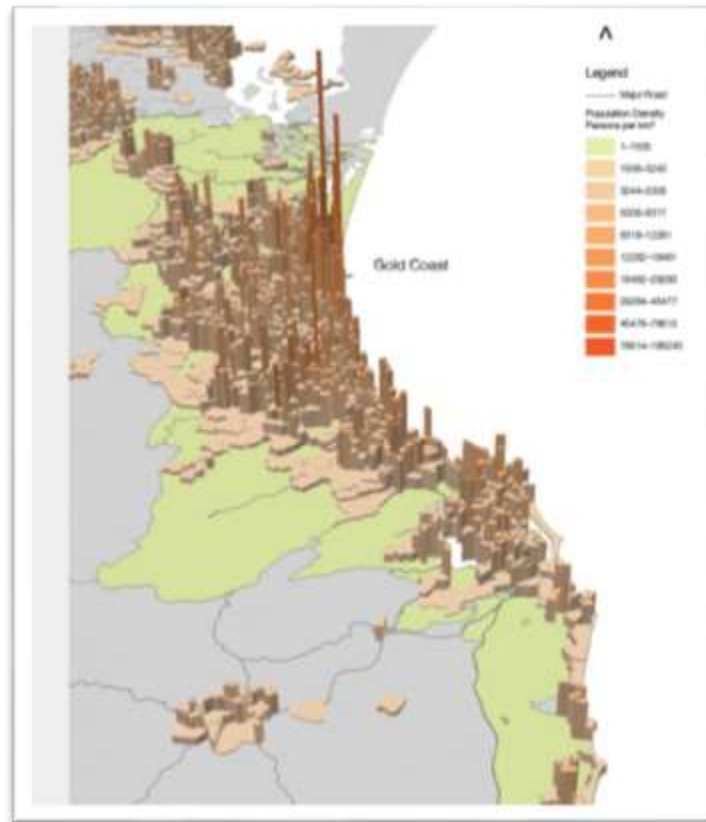


Figure 25-5: Projected changes in exposure to heat under a high emissions scenario (A1FI). Maps show the average number of days with peak temperatures >40°C, for ~1990 (based on available meteorological station data for the period 1975-2004), ~2050 and ~2100. Bar charts show the change in population heat exposure, expressed as person-days exposed to peak temperatures >40°C, aggregated by State/Territory and including projected population growth for a default scenario. Future temperatures are based on simulations by the GFDL-CM2 global climate model (Meehl *et al.*, 2007), re-scaled to the A1FI scenario; simulations based on other climate models could give higher or lower results. Data from Baynes *et al.* (2012).

Coastal urbanisation



Urban growth and challenges



State of Australian Cities 2012 Appendix A



Surfers Paradise Beach has suffered major erosion damage after the coastline has again been hammered by large swells. Picture: Adam Head, The Courier Mail Feb 23, 2013

Regional responses to complex issues



The Age 29 November 2007



The Age 29 Jan 2009



Gold Coast QLD Development in 1930 , 2007, Insurance Council of Australia 2008, Improving Community Resilience to Extreme Weather Events, p.4)

South West Coast WA

Mandurah and climate change

- Coastal inundation and extreme weather
- Coastal urban development
- Social and economic change
- Governance: 9 local councils working together

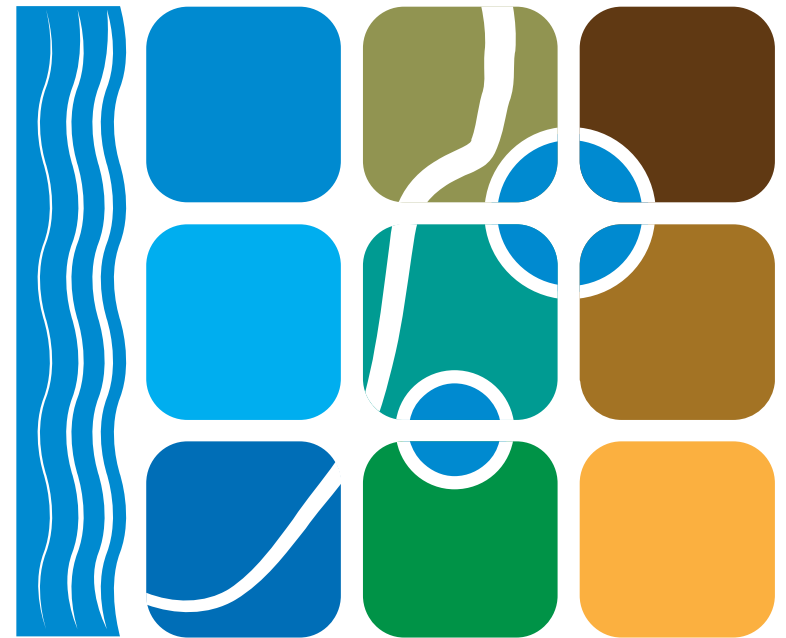


Source: <http://www.mandurah.wa.gov.au/climatechange.htm>

Peron Naturaliste Regional Partnership

Nine local councils in the south west WA voluntarily working together

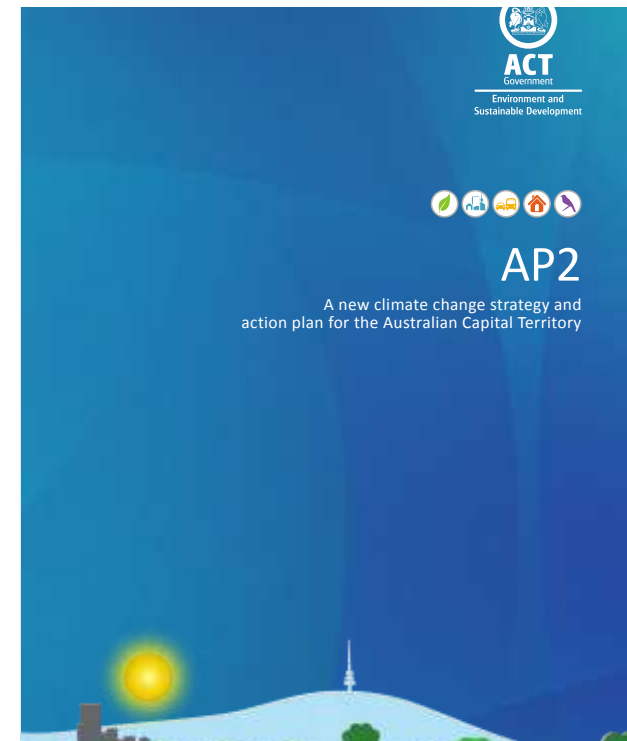
The **vision** of the Peron Naturaliste Partnership (PNP) is to empower a resilient regional community to reduce risks and optimise opportunities presented by climate change.



Peron Naturaliste
Partnership

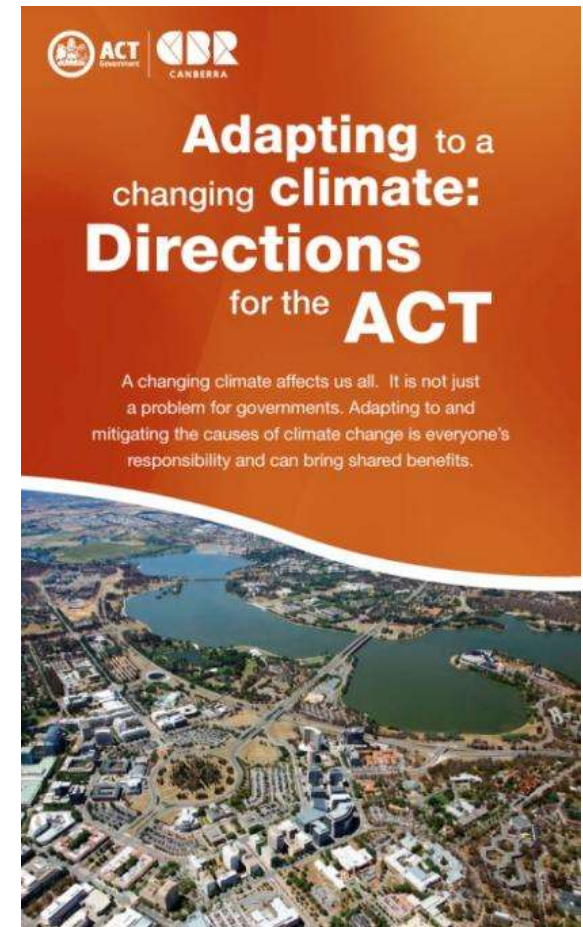
Mainstreaming climate change

- Reducing residential sector emissions
- Reducing non-residential sector emissions
- Reducing transport sector emissions
- Reducing waste sector emissions
- Transitioning to large-scale renewable energy
- Adapting to a changing climate
- Monitoring, reporting and future decision making



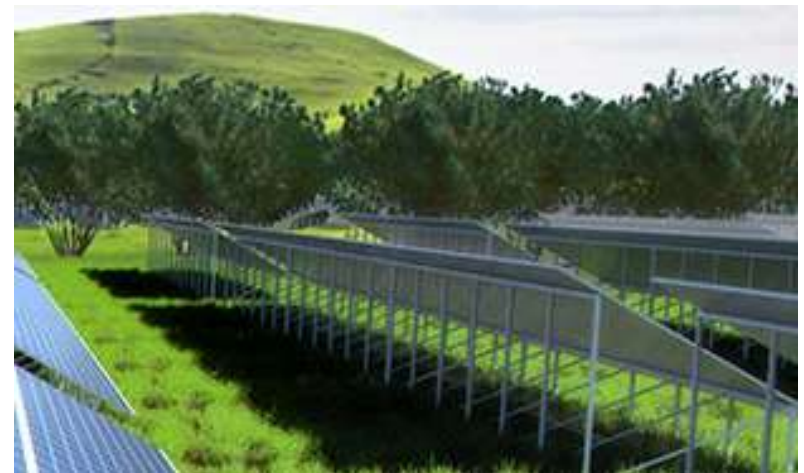
Policy to action in Canberra

- ACT Climate Change Adaption Strategy
- Mitigation and adaptation
- Plan of action for climate change adaptation
- Regional scale
- Regional Climate projections

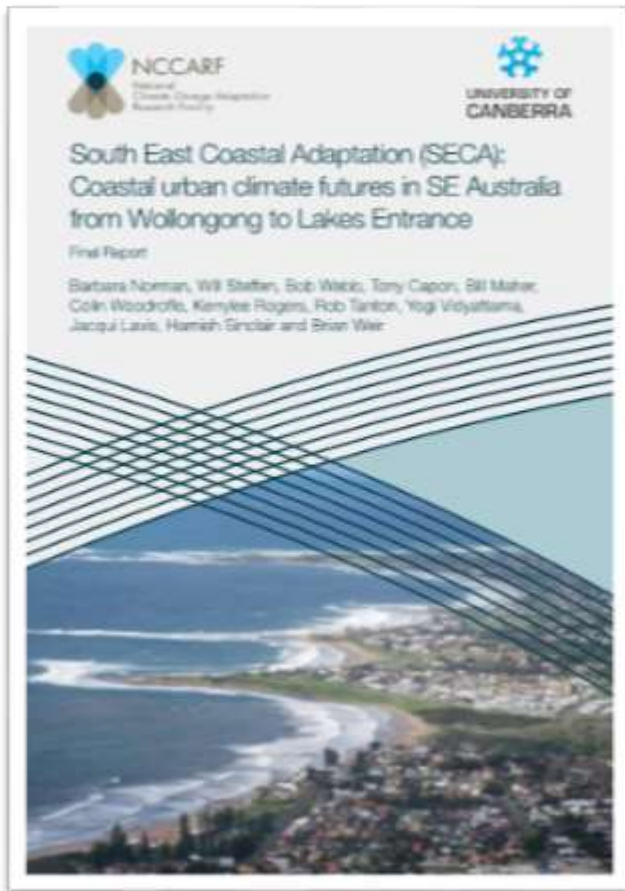


Renewable energy, transport, green precincts in Canberra

- On track for 90 % renewable 2020
- Shift to public transport
- Water sensitive urban design



South Coast Adaptation Report



Received 2014 'cutting edge research and teaching award' Planning Institute of Australia

Climate adapted coastal town 2030 south east coastal Australia

Principle 1

An integrated approach should be adopted for sustainable regional and local planning (social, economic, environmental and cultural).

Principle 2

The precautionary principle to decision making should be applied to the location of new and redeveloped urban settlement and infrastructure and other relevant decisions, particularly where environmental risk currently or potentially exists.

Principle 3

Risk management approaches should be incorporated into local and regional strategies for coastal settlements responding to climate and environmental change including progressive learning from experience to ensure adaptability.

Principle 4

Appropriate forums should be established at the regional level to enable collaboration across institutions at the local and regional level.

Climate adapted coastal town 2030 south east coastal Australia

Principle 5

There should be an ongoing process of community engagement. This needs to be informed by the latest science, in developing and regularly reviewing coastal urban plans to gain community support, and where possible support by all levels of government and across government agencies.

Principle 6

The skills and knowledge of regional and local communities should be connected by relevant organisations to provide a foundation for long-term research, co-production of knowledge and monitoring of coastal urban futures

Principle 7

A process of continuous monitoring, evaluation and reporting of adaptation actions should be implemented to ensure 'learning by doing' and to avoid past mistakes.

Norman et al 2013, *Coastal urban climate futures in SE Australia from Wollongong to Lakes Entrance*, National Climate Change Adaptation Research Facility, Gold Coast

Opportunities for decision makers



The Courier-mail, Cyclone Yasi in 2011. Picture: Tom Lee

1. Smart Infrastructure
2. Green precincts
3. Active travel (cycling, walking)
4. Renewable energy
5. Open space for adaptation
6. Managing coastal risks – storms, flood, fire and heat
7. Adaptive decision making

Great Barrier Reef and regional islands at risk



Great Barrier Reef – and climate change Guardian 31 March 2014

Cairns post February 2014

coolheadsforahotplanet2012

Building capacity in coastal planning



Key points

1. Extreme events already with recent significant loss of life and assets
2. Major implications particularly for coastal infrastructure and pacific islands
1. Limits to adaptation – human health and heat, Great Barrier Reef and rising sea surface temperatures
1. Innovative local and regional collaborations
2. Need an adaptation strategy for Australia and region

Contacts for further discussion

Canberra Urban and Regional Futures

www.curf.com.au

twitter: ProfBarbaraN

