

The Impact of Climate Change on Healthcare Facility Infrastructure: A Preliminary Investigation of Mitigation and Adaptation Strategies (presentation)

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Event details:

CHAA Future Health Facilities Conference 2007: Sustainability, Design, Financing & Research
Sydney, Australia

Publication Date:

2007

DOI:

<https://doi.org/10.26190/unsworks/1152>

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THE IMPACT OF CLIMATE CHANGE ON HEALTH FACILITIES: A preliminary investigation of mitigation and adaptation strategies

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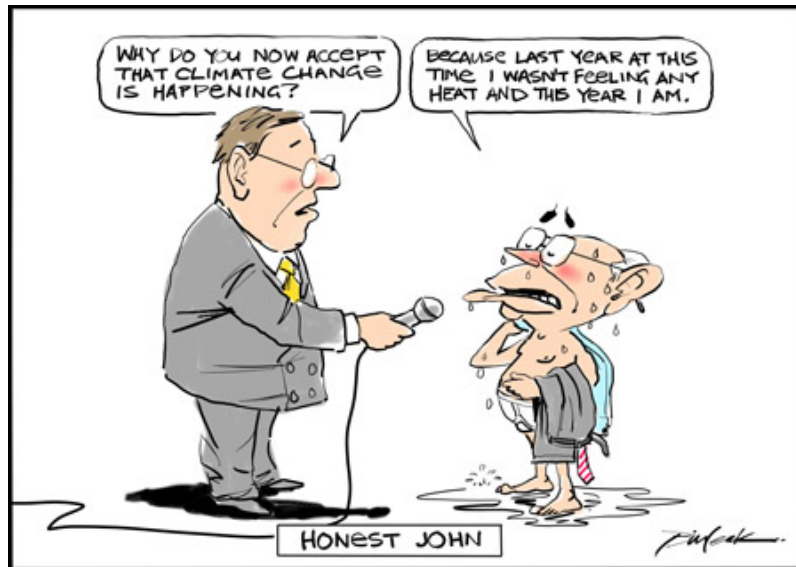
Web: www.chaa.net.au

THE IMPACT OF CLIMATE CHANGE ON HEALTH FACILITIES: A preliminary investigation of mitigation and adaptation strategies

Outline of presentation

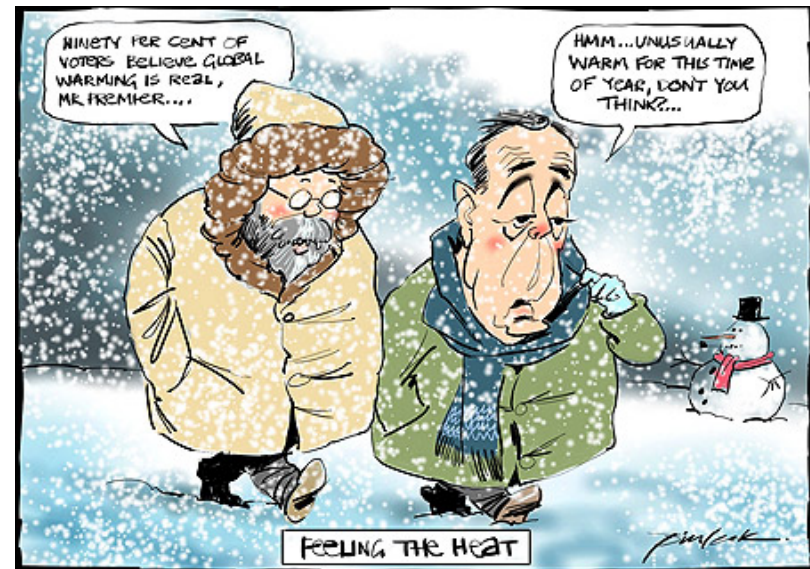
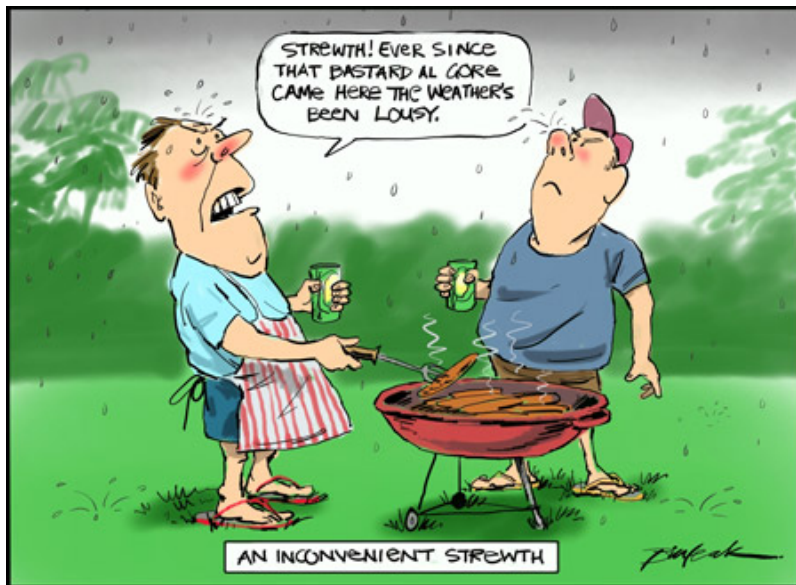
- **Context and background**
- **Implications of climate change on human health & health infrastructure**
- **Case studies**
- **Future research directions**

CONTEXT



With thanks to Bill Leak and The Australian Newspaper

CONTEXT



With thanks to Bill Leak and The Australian

BACKGROUND

Comments re the IPCC report issued on February 2, 2007 in Paris:

"Warming of the climate system is now unequivocal. That is evident in observations of air and ocean temperature as well as rising global mean sea level."

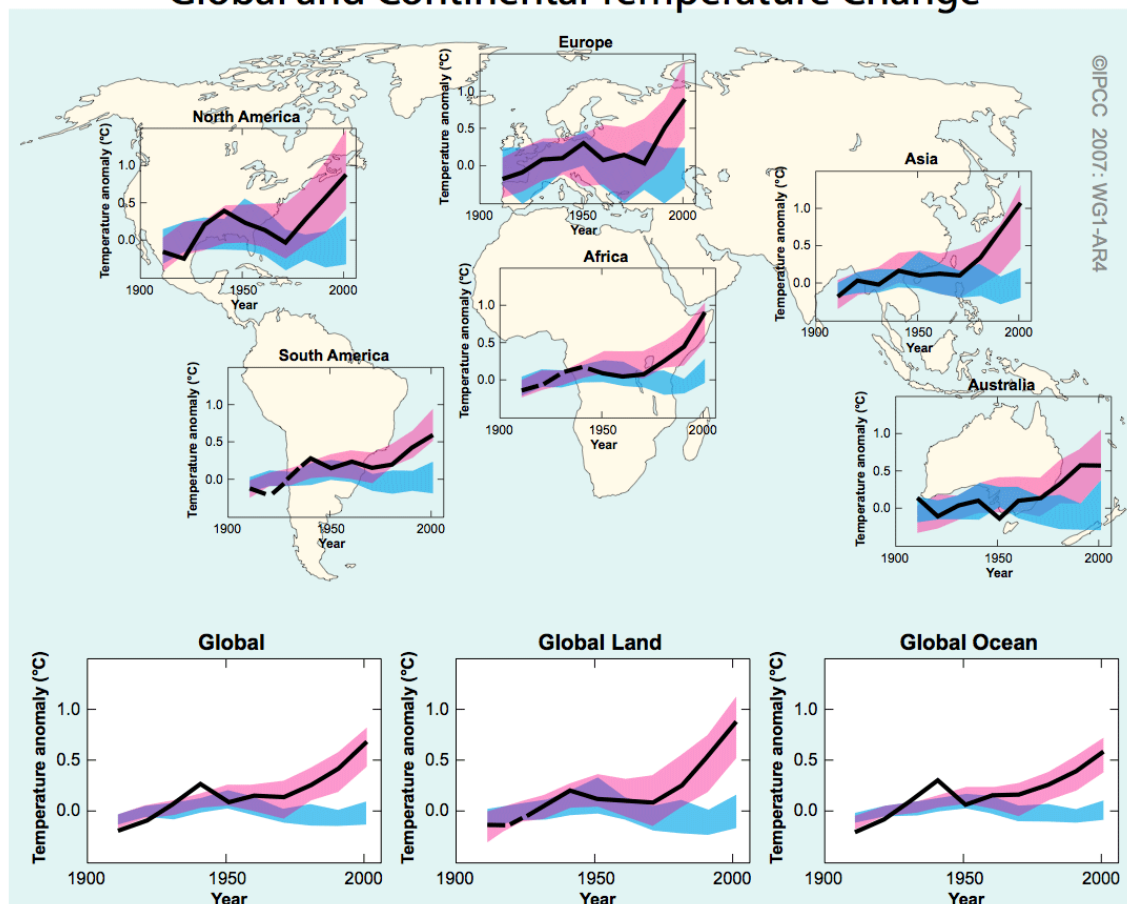
Susan Solomon, co-chair of the working group and an atmospheric scientist with the U.S. National Oceanic and Atmospheric Administration (NOAA).

"The 2nd of February in Paris will be remembered as the day that the question mark was removed from the idea that humans had anything to do with climate change."

Achim Steiner, executive director, United Nations Environmental Programme (UNEP)

BACKGROUND

Global and Continental Temperature Change



Comparison of observed continental and global-scale changes in surface temperature with results simulated by climate models using natural and anthropogenic forcings.

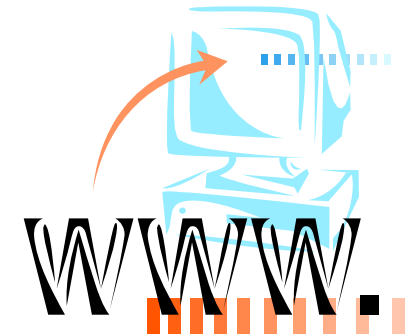
Blue = result of natural events only
i.e. solar activity & volcanoes

Red = natural and anthropogenic events

IPCC WGI Fourth Assessment Report 'Summary for Policymakers'

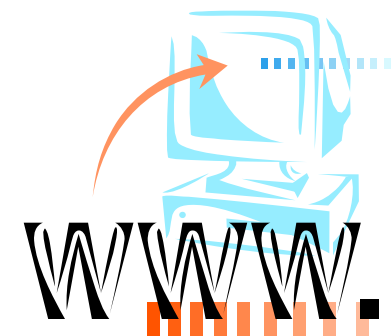
BACKGROUND

- Global climate change
- Climate change = increased occurrences of extreme weather events
 - [Heat waves and bushfires](#)
 - [Floods, storm surges, tsunamis](#)
- Inevitability of extreme weather events



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AUSTRALIA



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Predictions:

- Increase in annual average temp of 0.4-2.0°C by 2030
- More heatwaves and fewer frosts
- Prolonged drought and heavy rains
- More severe wind speed – cyclones, storm surges
- More frequent storms and bushfires
- Changing ocean currents - affect coastal waters

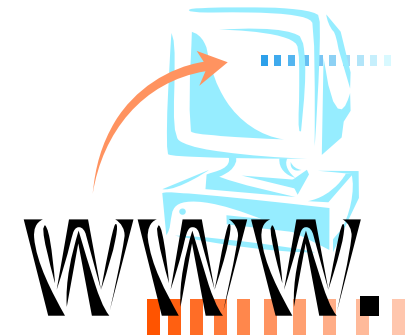


NSW

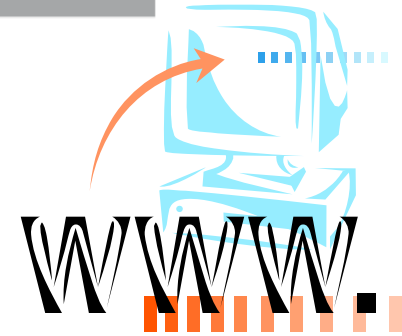
Predictions:

(increase of 0.4-2.0°C warmer average annual temperature)

- 50-100% more hot days >35°C and fewer cold nights
- More frequent heatwaves
- 70% increase in droughts
- 10-20% increase in the intensity of extreme daily rainfall
- More frequent rainstorms, strong winds (greater fire risks)



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OTHER STATES

Predictions - examples:

(increase of 0.4-2.0°C warmer average annual temperature)

- Reduction in rainfall, runoffs in South'n, East'n Australia
- *South Australia*: 18% increase in the annual days >35°C
- *Northern Territory*: 25% more days per year > 35°C
- *Victoria*: 6% decrease in extreme daily rainfall with 25% increase in 100-year storm tides along eastern Victoria coast
- *Queensland*: 100 year storm surge height around Cairns increases by 22% and area flooded doubles

IMPACTS OF HEATWAVES

- **On human health**
 - Direct effects on elderly and vulnerable (e.g. heatstroke)
 - Indirect effect (e.g. respiratory & cardiovascular diseases, vector borne diseases such as malaria)
- **On health services**
 - Increased demand (i.e. more staff needed)
 - Changing demographics of patients, often with significant co-morbidities
- **On health infrastructure**
 - Require more/larger facilities
 - Meet the needs of greater numbers of vulnerable patients
 - Cope with bushfires and other heat-related events
 - Transport and communication impacts

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IMPACTS OF HEATWAVES



Central Coast NSW – New Year's Day 2006

IMPACTS OF HEATWAVES

Central Coast NSW: NYD 2006

- Bushfires closed major roads north of Sydney (including the F3 freeway); major disruption to travellers in both directions.
- Emergency Management response: bushfire control, evacuation of residents at risk, traffic control for the F3 and traditional health service responses as required.
- People flocked to the Emergency Dept of Gosford Hospital to keep cool (air conditioning)



RESPONSES TO HEATWAVES

- Immediate response
 - Thermal control
- Long term response
 - Urban planning
 - Guidelines (eg ventilation, air quality, thermal condition)
 - Design (eg landuse, green spaces, water bodies)
 - Improved communication and transport links
 - Building planning
 - Architectural design
 - Facility management practices

IMPACTS OF FLOODS, STORM SURGES, TSUNAMIS

- **On human health**
 - Deaths and injuries
 - Infectious diseases
- **On health services**
 - Increased demand
 - Plans for emergency situations
- **On health infrastructure**
 - Structural damage
 - Stretched capacity

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IMPACTS OF FLOODS, STORM SURGES, TSUNAMIS



Cyclone Larry, Qld, 2006



Hurricane Katrina, US, 2005



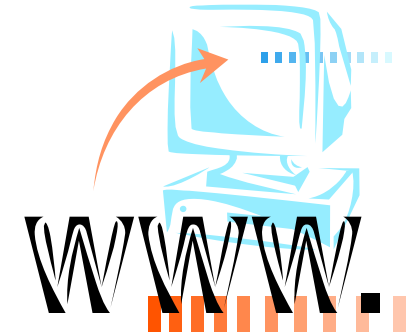
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IMPACTS OF FLOODS, STORM SURGES, TSUNAMIS

Cyclone Larry, March 2006

- Significant damage or disruption to hospital infrastructure
- Innisfail Hospital - severe damage / closed,
- ED continued to operate with support from Townsville and Cairns Base Hospitals.
- Herberton hospital - without power until generator provided
- Atherton Hospital - one wing evacuated due to a leaking roof
- medical support from within the State, additional nurses sent from Brisbane and Environmental health and mental health officers activated in the region.



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RESPONSES TO FLOODS, STORM SURGES, TSUNAMIS

- Immediate response
 - Increased public awareness
 - Warning procedure
 - Evacuation
 - Administrative operation
 - Relief plan: surge hospitals, counselling, etc
- Long term response
 - Urban planning
 - Regulations
 - Building design
 - Structural improvements

FUTURE RESEARCH AGENDA

- To **refine our understanding** of the impacts of extreme weather events on human health, health services, and health infrastructures
- To **assess the current adaptive capacity** of health services and health infrastructures
- To **identify practical adaptive and mitigation strategies for health services** and infrastructure subjected to extreme weather events

FUTURE RESEARCH



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NSW project:

Where are NSW health facilities located?

How will extreme weather events affect these locations?

What additional/different health service needs will climate change impose?

What do we need to do to prevent health service disruption due to extreme weather events?

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CONCLUSION



Art by the Sea, Sydney, SMH, 2006