



Managing disasters and adapting to climate change: what's the difference?

Jean Palutikof, NCCARF



Australian Government
Department of Climate Change
and Energy Efficiency



Outline

- Main findings in the IPCC Special Report on Extremes (SREX), published end 2011
 - Why IPCC reports are important
 - What the SREX has to say about climate change, extremes and adaptation
- Why extremes matter in climate change as well as in emergency management



Why IPCC reports are important

- The Inter-governmental Panel on Climate Change assesses the climate change literature so that international decision making is based on best evidence
- Scientists write IPCC reports, experts review draft chapters, governments accept reports by approving the Summary for Policymakers



The Approval Meeting



- Government negotiators on the floor
- IPCC on the podium: Co-Chairs, TSU, authors
- Text of SPM is projected line by line and approved



Text submitted to the Final Government Review	Roughly 20-30% of species are likely to be at high risk of irreversible extinction if global average temperature exceeds 1.5-2.5°C. * N [4.4]
Text projected at the Approval Meeting	<p>[Page 6, lines 27-28]</p> <p>Roughly Twenty to thirty percent 20-30% of species will be are likely to be at high risk of committed to irreversible extinction if increases in global average temperature exceeds 1.5-2.5°C. * N [4.4]</p>
Final published text	Approximately 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5-2.5°C

Evolution of the science

FAR: *insufficient observational evidence to make a statement*

SAR: 'The balance of evidence suggests a discernible human influence on global climate'

TAR: 'Most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations'

AR4: 'Most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations.'

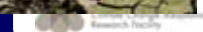


Strengths and weaknesses of the IPCC

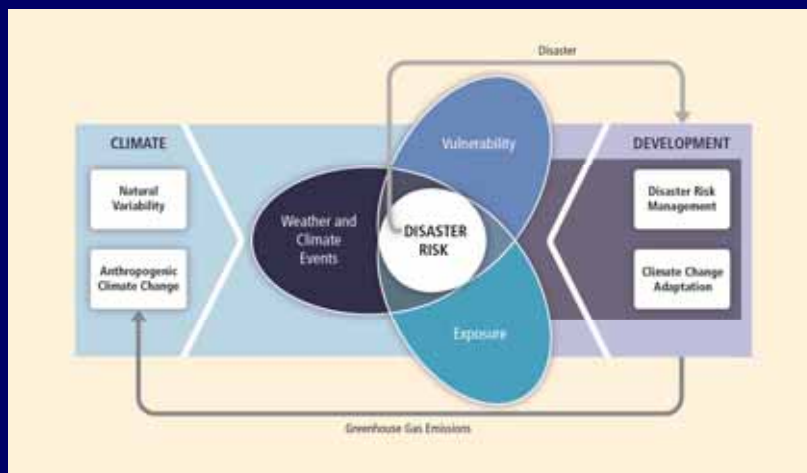
- The rigorous review process, by scientists and governments
 - Each chapter is reviewed three times
 - Elapsed time means science has moved on
- The approval process, bringing together governments and scientists to approve the SPM line-by-line
 - Governments are 'bought in' to the key statements in the SPM
 - Science is 'watered down'
- It is no more and no less than an Assessment
 - Perceived by governments as unthreatening and impartial
 - Widely misunderstood to do more
- Each Assessment is largely free-standing
 - Able to renew itself for every Assessment
 - Lack of corporate memory



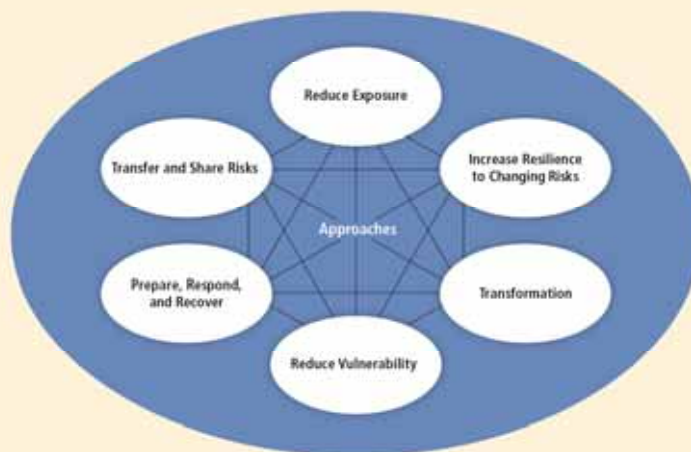
SREX: The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation



Core concepts of SREX



Adaptation and Disaster Risk Management Approaches for a Changing Climate



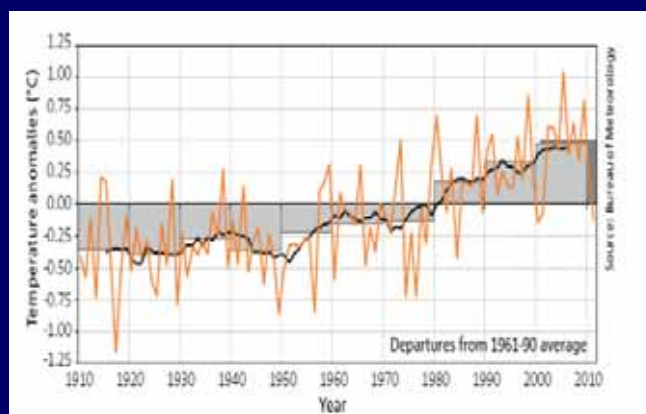
Since 1950, extreme hot days and heavy precipitation have become more common

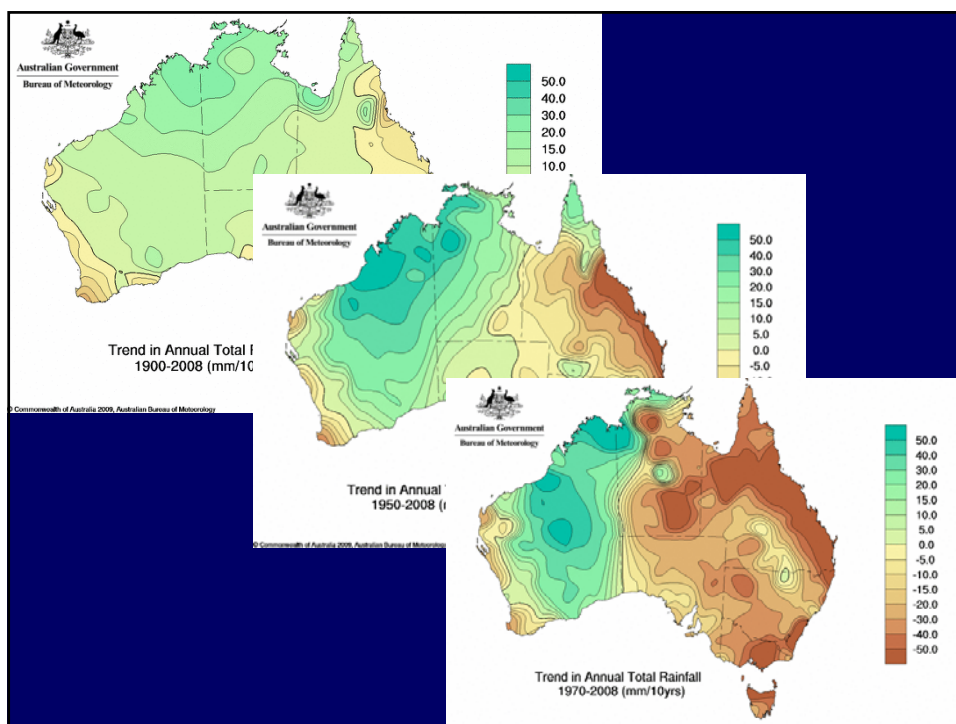


There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

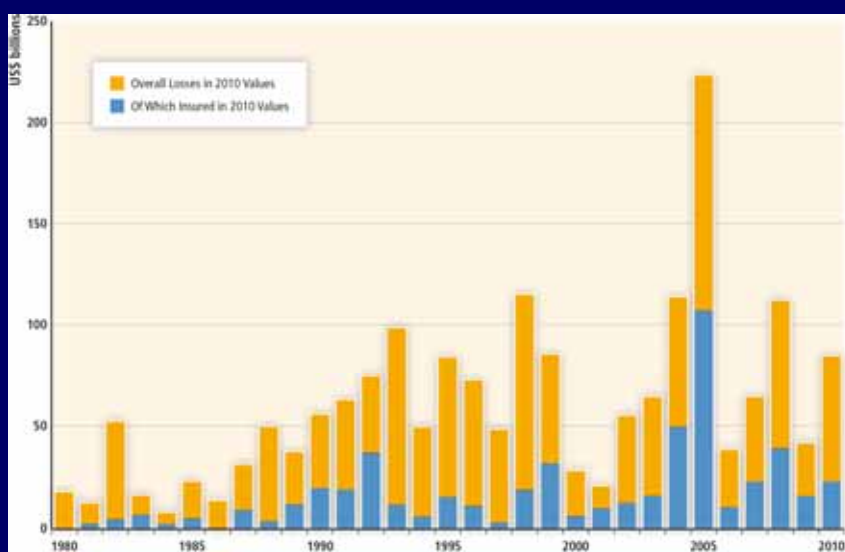
Temperature trend Australia

(CSIRO State of the Climate 2012)





Economic losses from climate-related disasters have increased, with large spatial and interannual variations



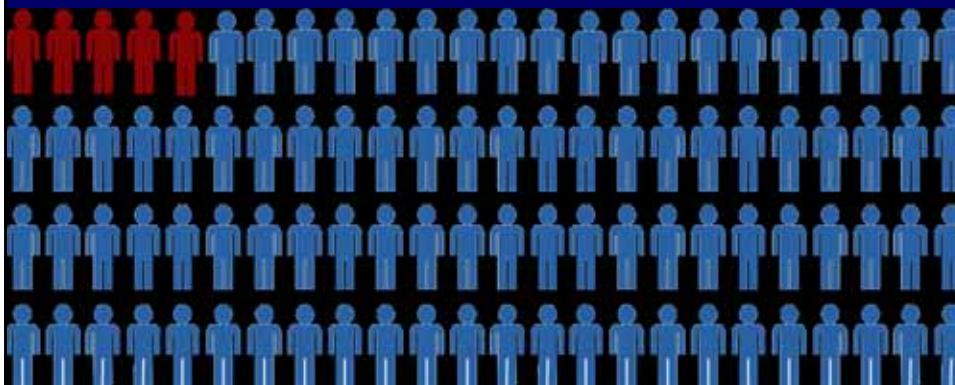
Increasing exposure of people and assets has been the major cause of changes in disaster losses



Economic disaster losses are higher in developed countries

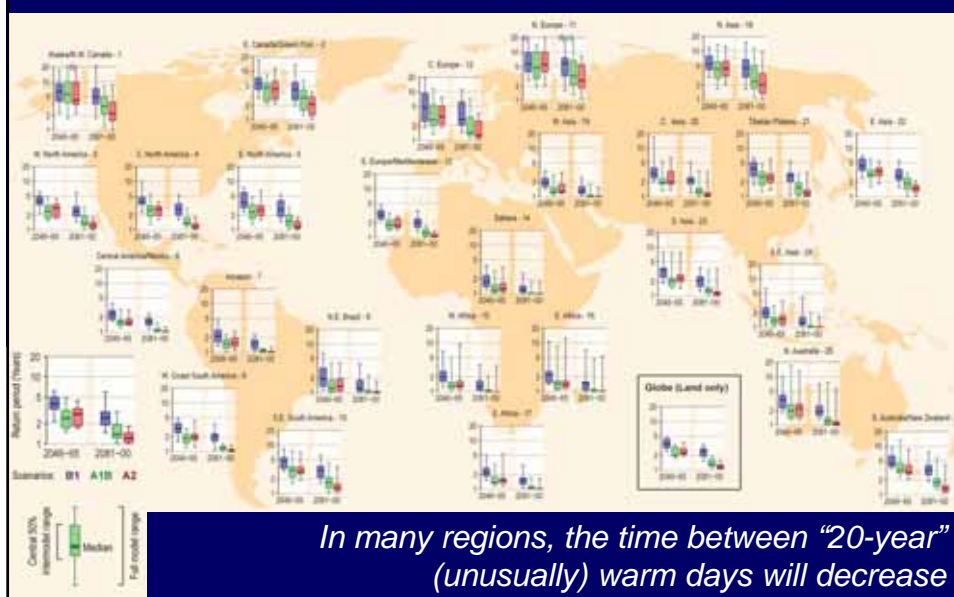


Fatalities are higher in developing countries

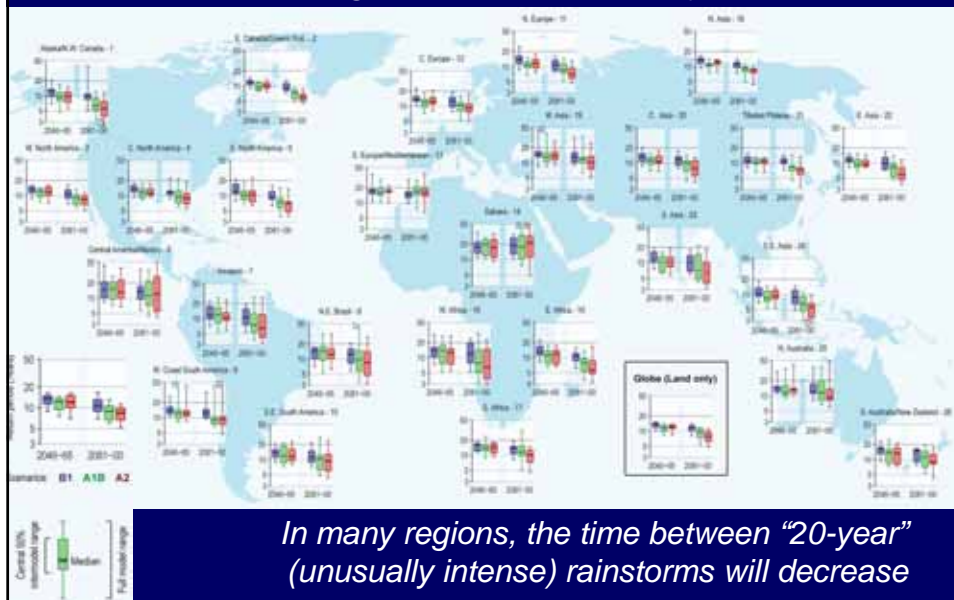


From 1970 to 2008, over **95%** of natural-disaster-related deaths occurred in developing countries

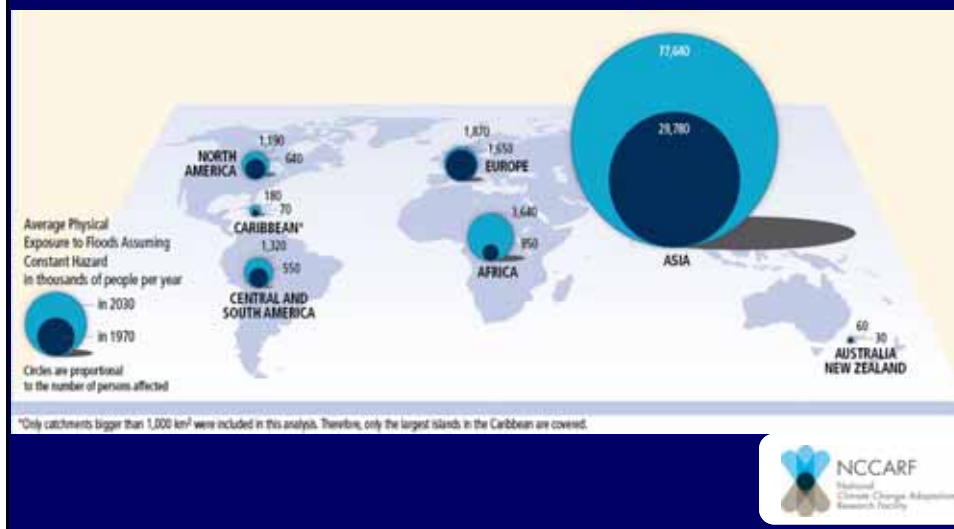
Climate models project more frequent hot days through the 21st century



Climate models project there will be more heavy rain events through the 21st century



Even without climate change, exposure will increase



Short-term actions don't always provide long term risk reduction



Permafrost thaw

- permafrost requires sub-zero temperatures
- melt affects roads, building foundations, airport infrastructure
- infrastructure maintenance needed
- short-term risk reduction won't eliminate long-term melt risk

Case Study: Northern Canada



There are strategies that can help manage disaster risk now and also help improve people's livelihoods and well-being



Why extremes matter in climate change as well as in emergency management

The most effective strategies offer development benefits in the relatively near-term and reduce vulnerability over the longer term



To learn more, visit:

www.ipcc.ch

Why extremes matter in climate change as well as in emergency management

- Most people will experience climate change through a change in extremes
- Some of the greatest costs of climate change will come through changes in extremes



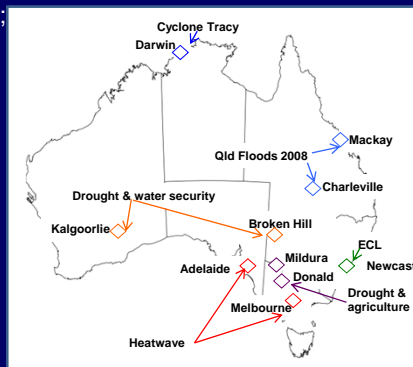
By studying extremes that have occurred in the past, we can learn useful lessons about how to adapt to future climate change

What we can learn about adapting to climate change by studying extremes



Seven historical case studies

- **Cyclone Tracy**, Darwin Christmas Day 1974;
- **Drought** in small inland towns, looking at:
 - **Agricultural communities:** Donald (dryland) and Mildura, (irrigation)
 - **Mining communities:** Broken Hill and Kalgoorlie
- **Heatwaves**, late January – early February 2009, Melbourne and Adelaide;
- **Queensland floods in 2008**, Charleville and Mackay
- **Storm tides**, the 1950s to the mid 1970s along the east coast of Australia
- **An East Coast Low:** the Pasha Bulker storm which struck Newcastle in June 2007.



Cyclone Tracy: the event

- Very small, slow moving Category 4 tropical cyclone
- Struck Darwin Christmas morning 1974
- 71 deaths, 650 injured
- 94% of housing uninhabitable
- 40 000 people homeless, 80% evacuated
- A 'national horror'
- Housing built for daily conditions not extreme events



Journal of the Australian Department of Health Volume 25 Number 2



Cyclone Tracy – response

- Military style command
- Evacuation –permit system to control return
- Assessment – all buildings, why buildings failed
- Construction moratorium
- New building standards adopted in cyclone prone areas
- Standards tested during subsequent cyclones



The reconstruction process.
Image: ABC TV Collection



Successful adaptation

House condition reporting following Cyclone Yasi
Building damage largely restricted to older houses (pre-Tracy regulations)



Damage to pre-Tracy home
(Cyclone Yasi, Cardwell)



Damage to modern house
(Cyclone Yasi. Cardwell)



The Indigenous experience

- Limited documentation of Indigenous people
- Experience specific to background & context
- Psychological impacts
- Strong desire to return to country (Darwin)



“...An Aboriginal person can’t live on someone else’s land. They’ve got a thing of homeland, their homelands (Respondent 4)”



Storm tides on the east coast

- Wind storm increases sea level, *plus* large waves result in coastal erosion & inundation
- Stormy periods and calm periods (Inter-decadal Pacific Oscillation; SOI)
- Particularly stormy period in the 1950s - 1970s resulted in severe erosion, property and economic loss
- Three case study communities



Storm tides on the east coast

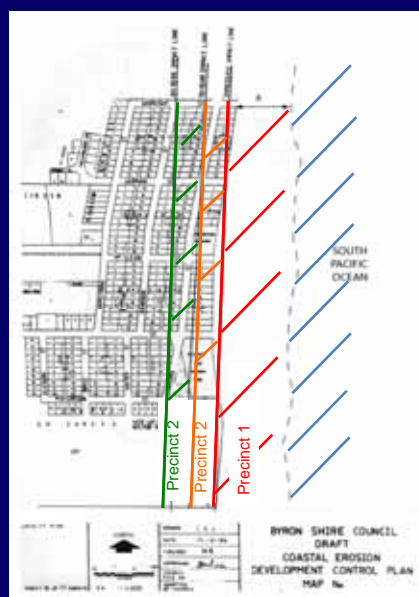
- Immediate response *ad hoc*
 - Dumping car bodies, private sea walls
- Longer term:
 - Research & understanding of erosion processes and coastal protection (identify at risk properties)
 - Statutory bodies, regional strategies
 - Protection strategies (sea walls, beach nourishment, groynes)
 - Planning measures (buybacks and setbacks)



Storm tides – the response

Example from Byron Bay

- Hazard lines based on storm event return periods
- Planned retreat of development
- Precinct 1: immediate storm threat; no mains power
- Precincts 2 & 3: 50 & 100 year storm risk; building must be relocatable (surrender land)



But 30 years of calm weather...

- 'Calm weather' planning
- No test of protection strategies
- Beach recovery (accretion) hasn't happened
- Sea level rise threat



Eight lessons to be learned

Enabling adaptation:

- Government at all levels need to provide frameworks that enable adaptation through incentives and regulation

Timeliness of adaptation:

- Actions should be pragmatic, realistic & forward thinking
- Some adaptation actions can have unintended consequences for successive events and other sectors
- Short-term solutions are not always suitable for the long-term
- Recognising a new type of disaster or knowing when to call a situation an emergency is critical to successful adaptation

Awareness:

- Communities need to be aware and prepared
- Communities may need to recognise that something has to change

Practicality:

- Vulnerability tied to geography

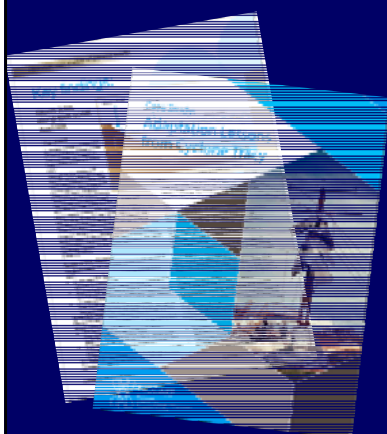


...and a few reflections

- Resilience or stoicism?
- Why does nothing happen? Barriers to translating knowledge into action
- Who bears the cost?



Where to find more information



NCCARF:
www.nccarf.edu.au

SREX Report:
www.ipcc.ch

